



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

September 13, 2005

N. C. Department of Environment and Natural Resources  
Division of Coastal Management  
1367 U. S. Highway 17  
Elizabeth City, NC 27909

Attn: Ms. Lynn Mathis  
NCDOT Coordinator

Dear Ms. Mathis:

Subject: **Application for CAMA Major Development Permit Application** for the proposed Windsor Bypass. US 17 from US 13-17 to East of SR 1503 (Davis Road). Bertie County. Contract ID No. C201236. TIP No. R-2404A. W.B.S. 34424.3.7

The North Carolina Department of Transportation (NCDOT) proposes to improve existing U.S. Highway 17 (US 17) to a high speed, multi-lane highway that bypasses the Town of Windsor (R-2404A). The purpose of the project is to improve mobility through Bertie County on US 17 without delays caused by local traffic. The project will include 2.3 miles of existing road widening from 2 to 4 lanes and 7.3 miles of new alignment 5-lane divided highway, including dual 1,700-foot bridges crossing the Cashie River. The design-build project is scheduled to begin construction in January 2006 and to be completed by June 2008.

The purpose of this document is to submit this final design for approval and to request approval of a Clean Water Act Section 404 Individual Permit, Section 401 Water Quality Certification, and Coastal Area Management Act (CAMA) Major Development Permit. Included in this application package are the following: (1) CAMA Major Development Permit Application forms, (2) property owner certified mail delivery receipts, (3) ENG Form 4345 Application for Department of the Army Permit, (4) Isolated Wetlands Addendum for impacts at a proposed borrow area, (5) stormwater management plan, (6) Merger 01 4B and 4C meeting minutes, (7) North Carolina Ecosystem Enhancement Program (EEP) acceptance letter, (8) vicinity and site maps, (9) list of property owners, (10) permit impact summary table, (11) half-size permit impact sheets, and (12) a full set of roadway plans.

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**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Preliminary geotechnical borings for R-2404A were permitted under a Nationwide Permit No. 6 in July 2004 (Action ID 1994000453) and completed in October 2004. No additional fieldwork on this project has occurred, with the exception of surveying, right-of-way acquisition, and environmental and engineering field reviews. No staging of materials or construction will occur until all permits have been approved by the respective regulatory agencies. Site-specific data such as quality and classification information for wetlands and streams is derived from the Natural Resources Technical Report (NRTR), which was prepared in May 2002 for NCDOT and TGS Engineers by Environmental Services, Inc. Additional recent field reconnaissance was performed to update the NRTR's data, and is noted below.

### Summary of Impacts

Table 1 lists all proposed impacts associated with the construction of R-2404A. These impacts are detailed by site in the Resource Impacts section of this document.

*Table 1: Summary of Impacts*

Permanent Wetland* (acres)	Temporary Wetland^ (acres)	Isolated Wetlands (acres)	Streams^ (linear feet)	Streams Requiring Mitigation (lf)	Surface Waters# (acres)
68.56	1.32	0.66	2,035	1,354	1.06

\* Wetland impact calculations include fill, excavation, and mechanized clearing; difference from permit impact summary sheet is due to inclusion of borrow/haul road impacts.

^ Difference from permit impact summary sheet is due to inclusion of haul road impacts.

# Surface water calculations include ponds and streams without mitigation requirements; difference from permit impact summary sheet is due to rounding to two decimal places at each site.

The Cashie River and associated bottomland wetland system will be bridged using dual 1,700-foot structures. Temporary impacts necessary for the on-site roadway detours and haul roads are included in the impact calculations and discussed below. Utility relocation impacts have also been assessed and are included with this permit application.

### Summary of Mitigation

On-site mitigation opportunities have been fully evaluated, as described later in this document. Avoidance and minimization measures have been maximized to the greatest practical extent throughout the planning and design effort. The remaining unavoidable impacts will be mitigated through the EEP. It is anticipated that the following impacts will require mitigation:

- 4.05 acres (ac) of Riparian Wetlands,
- 64.51 acres of Non-riparian Wetlands,
- 0.66 acres of Isolated Wetlands, and
- 1,354 linear feet (lf) of Important Stream Channel.

### **CAMA JURISDICTION**

R-2404A is located in Bertie County, one of the twenty coastal counties under the jurisdiction of the CAMA. However, the only Area of Environmental Concern (AEC) within the project area is the Cashie River, a navigable "public trust" waterway under CAMA guidelines. The coastal

buffers of 30 feet from normal water line are presented in the permit impact sheets. This public trust water, and the associated buffer, are bridged entirely by the dual structures over the Cashie River. A full description of the Cashie River bridge and associated impacts is included under Site 7 on pages 7 and 14 and included in the impact tables below. As discussed during the 4C concurrence meeting, the pile locations within the river channel and oxbow allow adequate passage for the type of boat traffic that currently uses this reach of the Cashie River. The downstream bridge in the Town of Windsor has a constricted clearance of approximately two feet (at normal water levels), and two crossings upstream on the River are no longer considered public trust (not navigable).

The impacts to the public trust waters and associated buffers have been minimized to the greatest practical extent, as described on page 14. The proposed top-down construction method was determined to involve the least impact to the wetlands and river, since no workbridge or other temporary access will be required during construction of the bridge. The bridge bent configuration, with six or seven piles per bent depending on the location, totals less than 0.01 acres of impact. The steel H-piles used in construction will be pile-driven, further reducing disturbance to the aquatic system. Within the open surface waters, only six piles per bent will be used in order to maximize spacing and allow adequate boat passage.

The Cashie River is located in the Roanoke River Basin (USGS Hydrologic Unit 03010107, NCDWQ Subbasin 03-02-10). The best usage classification for the Cashie River (NCDWQ Index No. 24-2-(1)) is Class C-Sw from its source to a point 1 mile upstream of SR 1500 in Bertie County. The River is listed as partially supporting its best usage classification due to a statewide fish (bowfin) consumption advisory. The River is also included in North Carolina's 2002 Section 303(d) List, and in the current 2004 draft list, as impaired due to this fish consumption advisory. The River is not listed in the National Wild and Scenic Rivers System maintained by the National Park Service. No High Quality Waters, Water Supply Waters, or Outstanding Resource Waters are located within 1 mile of the project.

#### **NEPA DOCUMENT STATUS**

This project has completed the Merger 01 Process. Several meetings were held by NCDOT and the respective regulatory agencies to determine the Least Environmentally Damaging Practical Alternative (LEDPA) and bridge sites. The results of these meetings were incorporated into the Final Environmental Impact Statement, which was approved on August 29, 2003. A Record of Decision (ROD) was issued on August 26, 2004. All commitments in the ROD were complied with during the preparation of the final design.

No additional impact areas or significant changes to the right-of-way or roadway alignment have occurred since the completion of the ROD. Therefore, no additional NEPA documentation is required for the project. All borrow and staging areas have been evaluated by qualified consultants for jurisdictional waters under the Clean Water Act, federally protected species, and archaeological resources. There will be no impacts to any of these resources from borrow/staging activities or haul roads related to this project, except as noted in the following documentation.

## RESOURCE IMPACTS

The following section describes the issues related to proposed impacts to jurisdictional wetlands and streams associated with R-2404A. The final plans showing the projected impacts are attached. Site-specific avoidance and minimization techniques are detailed below in the Mitigation section. Table 2 presents a summary of these impacts, while a detailed breakdown of the proposed impacts is attached with the permit impact sheets.

*Table 2: Summary of Impact Sites*

Site No.	Permanent Wetland* (ac)	Temporary Wetland (ac)	Streams (lf)	Streams Requiring Mitigation (lf)	Surface Waters^ (ac)
1	0.38	0	286	89	0.76
2	0.01	0	39	0	0.01
3	0.02	0	0	0	0
4	3.61	0	1,450	1,265	0.10
5	0.06	0	0	0	0
6	0.26	0	0	0	0
7@	0.00	0	0	0	0
8	0.28	0	0	0	0
9	0.19	0	0	0	0
10	10.98	0	0	0	0
11	0.00	0	211	0	0.09
12	6.72	0	0	0	0
13	4.59	0	0	0	0
14	30.66	1.30	0	0	0.10
15	0.62	0	0	0	0
16	9.29	0	0	0	0
17	0.81	0	0	0	0
18	0.01	0	0	0	0
19	0.07	0	0	0	0
IP#1 #	0.66	0.02	49	0	0
<b>Total</b>	<b>69.22 ac</b>	<b>1.32 ac</b>	<b>2,035 lf</b>	<b>1,354 lf</b>	<b>1.06 ac</b>

\* Wetland impact calculations include fill, excavation, and mechanized clearing; difference from permit impact summary sheet is due to inclusion of haul roads and rounding to two decimals at each site.

^ Surface water calculations include ponds and streams without mitigation requirements;

@ Site is bridged – 0.01 acres of wetland impacts from piles not included in totals.

# Borrow area impacts not shown on permit impact summary sheet (see Exhibit B). Permanent impacts to isolated wetlands only.

Tables 3 and 4 present detailed descriptions of the status and quality of each of the impact sites.

**Table 3: Jurisdictional Stream Information**

Site No.	Station Number	Impact Structure *	Stream Name #	DWQ Index No.	Stream Status ^	Impact (lf)	Required Mitigation (lf)
1	L 44+50	8x6 RCBC	UT to Cashie R.	24-2-(1)	P	89	89
2	L 85+40	48" RCP	UT to Cashie R.	24-2-(1)	IU	39	0
4	L 138+10	36" RCP	UT to Cashie R.	24-2-(1)	P / IU	1,450	1,265
11	L 264+50	36" RCP	UT to Hoggard Mill Creek	24-2-6	IU	211	0

\* Structures: Reinforced concrete box culvert (RCBC), Reinforced concrete pipe (RCP);  
# Unnamed tributary (UT); ^ Stream status: Perennial (P), Intermittent Unimportant (IU)

**Table 4: Jurisdictional Wetland Information**

Site No.	Riparian/ Non-riparian ^	Cowardin Classification ^ #	Impact Type(s)*	Wetland Quality ^	Impact Acreage
1	Riparian	PEM / PFO	F / E / M	Medium	0.38
2	Non-riparian	PFO	M	Low	0.01
3	Non-riparian	PFO	F / M	Medium	0.02
4	Riparian	PFO	F / E / M	Low/Medium/High	3.61
5	Riparian	PFO	F / M	High	0.06
6	Non-riparian	PFO	F / M	Low	0.26
8	Non-riparian	PSS / PFO	F / M	Low	0.28
9	Non-riparian	PFO	F / E / M	Low	0.19
10	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	10.98
12	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	6.72
13	Non-riparian	PEM	F / M	Low	4.59
14	Non-riparian	PEM / PSS / PFO	F / M	Low	30.66
15	Non-riparian	PSS	F / M	Low	0.62
16	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	9.29
17	Non-riparian	PEM	F / M	Low	0.81
18	Non-riparian	PSS	F / M	Low	0.01
19	Non-riparian	PSS	F / M	Low	0.07

^ Based on NRTR-provided data;

# Classification Types: Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), Palustrine Forested (PFO);

\* Impact Types: fill (F), excavation (E), and mechanized clearing (M)

### Delineations

Wetland and stream delineations were conducted from June through August 2001 using the 1987 US Army Corps of Engineers (USACE) methodology. Representatives from the USACE Washington Regulatory Field Office verified the wetland delineation on September 6 and October 30, 2001. Stream delineations were verified by the USACE on October 30 and

November 9, 2001. The delineations and corresponding verifications are valid through the same dates in 2006. On May 25, 2005, a representative from the USACE Washington Regulatory Field Office concurred with adjustments to the stream channel status at Sites 1 and 4. These changes were incorporated into the plan set and discussed in the Concurrence Point 4C meeting (see attached meeting minutes). On August 23, 2005 an adjusted southern wetland boundary at Site 10 was field verified by the USACE. Borrow area delineations were also field verified by USACE representatives on May 25 and August 23, 2005.

### Wetland and Stream Impacts

The vast majority of proposed wetland impacts occur along the eastern half of the project at Sites 10, 12, 13, 14, and 16 (see Table 4 above). These proposed impacts occur mainly in low quality non-riparian wetlands that are currently at various stages of silviculture management (recent clearcuts, newly planted pine stands, maturing pine plantations, etc.). Stream impacts occur at four sites: 1, 2, 4 and 11. Streams requiring mitigation occur at Sites 1 and 4. A site-by-site description of impacts follows:

**Site 1 (Sta 41+50 to 49+00)** has impacts to 89 linear feet of perennial stream, 197 linear feet of intermittent unimportant stream, 0.38 acre of associated emergent and forested wetlands, and 0.76 acre of surface water including two ponds. A roadside ditch at Station 51+00 Rt, presented in the original mapping as a stream channel, was determined not to be under Section 404 jurisdiction by the USACE. The intermittent unimportant stream reach is a 1.5' wide, C/G Rosgen-type stream with a loamy substrate and somewhat poorly-defined channel. The perennial stream is a 20' wide channelized reach that is classified as a C/E Rosgen-type stream and is typically ponded. The emergent wetlands are dominated by Polygonum (*Polygonum* spp.), jewelweed (*Impatiens capensis*), and lizard's tail (*Saururus cernuus*), and the forested wetlands by red maple (*Acer rubrum*) and various young hardwoods and shrubs. These impacts are due to the culvert extension on the upstream side of the road and fill slopes required for the roadway widening. The culvert extension impacts the perennial stream channel in a section that is typically ponded and has relatively low flows. As agreed upon in Concurrence Point 4B, the existing culvert will be extended with the bottom of the extension at the stream bed channel rather than embedded one-foot. This is necessary since the existing culvert inlet is on the stream bed, and the potential for headcutting upstream if the culvert extension were embedded. The intermittent stream reach and emergent and forested wetlands will be filled as a result of the road widening. The two ponds, the larger of which has no upgradient jurisdictional features, are considered total takes due to draining. The ponds require draining since the embankments will be within the proposed right-of-way (ROW) for the project. A portion of the smaller pond will be filled for roadway construction. Due to the need for a haul road through the larger pond, as well as the required roadway fill, the entire pond will be filled and graded to drain to the existing cut ditch. Filling this pond eliminates the need for a driveway pipe and additional wetland/stream impacts at this location.

**Site 2 (Sta 85+10 to 88+00)** has 0.01 acre of impact to low quality, forested wetlands due to mechanized clearing. A pipe extension is also proposed that impacts 39 linear feet of intermittent unimportant stream channel. The wetland is dominated by broad-leaved deciduous vegetation, including red maple, sweetgum (*Liquidambar styraciflua*), and swamp tupelo (*Nyssa*

*biflora*), with little to no shrub or herbaceous layer. The stream is a G Rosgen-classified reach that is 4' wide and appears to have been channelized.

**Site 3 (Sta 115+60 to 117+90)** has 0.02 acre of forested wetland impacts due to a pipe extension and mechanized clearing on the upstream side of the roadway. This wetland is an inundated hardwood forest containing swamp tupelo, red maple, bald cypress (*Taxodium distichum*), and sweetbay (*Magnolia virginiana*).

**Site 4 (Sta 129+00 to 141+80)** is located at the major interchange on the project and includes a total of 3.61 acres of fill in medium- and high-quality forested wetlands. This impact includes total takes of the wetland areas internal to the interchange in quadrants A and D. The total take areas are discussed by site and included in the calculations, but are not shown as impacts on the plan sheets to prevent unintentional encroachment into these areas. This site also includes 1,450 linear feet of stream loss, mainly due to the piping of a perennial stream that currently runs through the existing intersection. This stream loss does not include the segments internal to quadrants A and D, since the adjacent wetland buffers will remain in place to help preserve the existing function of the stream channel. Upgradient of the existing roadway, 157 feet of perennial stream (C Rosgen-type stream with a sandy substrate, approximately 3' wide), 185 feet of intermittent unimportant stream (sand-dominated 3' wide channel that originates at a seep), and 0.21 acres of low- and high-quality wetlands are to be impacted by fill and a drainage ditch. The ditch is required to protect the toe of slope from off-site runoff and ties back into the wetland area to be retained above the roadway. The wetlands above the existing roadway are dominated by broad-leaved deciduous forest (red maple, swamp tupelo, sweetgum, etc.) with some bald cypress interspersed. Downstream of the existing roadway 3.40 acres of medium-quality wetlands and 1,108 feet of perennial streams will be impacted by roadway fill and requisite piping. The northernmost channel is a 3' wide, F Rosgen-class stream with a sandy substrate. The southern reach is a G to E/C Rosgen-type stream that is 4'-5' wide and sand-dominated. The wetlands are very similar to those found at the upstream portion of Site 4.

**Site 5 (Sta 144+00 to 146+10)** is a 0.06 acre impact to high quality wetlands adjacent to the Cashie River. The impacts are due to a small amount of fill and hand clearing along the approach to the bridge location. These impacts are unavoidable due to the geometry of the alignment along the short distance between the US 13 interchange and the bridge location. This wetland is part of the Cashie River cypress-gum bottomland system, which includes numerous broad-leaved deciduous overstory trees with a relatively sparse understory containing sweetbay, slippery elm (*Ulmus rubra*), greenbrier (*Smilax* spp.), sedges (*Carex* spp. and *Cyperus* spp.), rushes (*Juncus* spp.), and numerous fern species.

**Site 6 (Sta 149+00 to 153+50)** is a 0.26 acre fill and clearing of a low-quality wetland that is adjacent to an existing borrow pit. This fill is caused by the roadway fill approaching the bridges over the Cashie River. The wetland is a broad-leaved deciduous forest dominated by red maple, sweetgum, blackberry (*Rubus* spp.) and greenbrier. A portion (1.18 acres) of the borrow pit (listed as a pond in the NRTR) will also be filled for roadway construction, but this is not considered a surface water loss as it is an active borrow pit within an upland area. The USACE confirmed that this borrow pit is not under Section 404 jurisdiction on August 23, 2005.

**Site 7 (Sta 155+00 to 172+00)** is the dual 1,700-foot bridges over the Cashie River and the adjacent high quality bottomland hardwood swamp (see Site 5 for wetland description). Of the 424 driven bridge piles (H-piles), 392 are located within the wetlands and will have a direct impact on less than 0.01 acre of high-quality riparian wetlands. In addition, the bridge will have a shading effect on 2.53 acres of wetlands and 127 linear feet (0.41 acre) of the Cashie River. The bridge is a cored slab structure with thirty-four 50-foot spans built using top-down construction. Hand clearing will be performed in 5.02 acres of the forested wetlands under the bridge and on 25 feet to either side to allow for the swing of the crane booms.

**Site 8 (Sta 175+80 to 180+00)** is a 0.28 acre fill and mechanized clearing of a linear, low-quality wetland drainage. No cross pipe is required to the wetland south of the road since there is a ridgeline that separates these wetland features. The wetland is characterized by a mix of deciduous forest and scrub-shrub vegetation, including red maple, sweetgum, green ash (*Fraxinus pennsylvanica*), sweetbay, and Chinese privet (*Ligustrum sinense*).

**Site 9 (-Y5- Sta 16+50 to 21+00)** is at the overpass of Greens Cross Road over the proposed roadway. Three areas, totaling 0.19 acre, of low-quality wetland drainages will be impacted due to roadside ditches, fill for roadway construction, temporary fill for an on-site detour, and mechanized clearing. This also includes a small area above the realigned -Y5- at station 21+00 that is considered a total take. These wetlands are dominated by deciduous and evergreen forest, including loblolly pine (*Pinus taeda*), red maple, sweetgum, green ash, and swamp tupelo.

**Site 10 (Sta 217+10 to 258+60)** includes 10.98 acres of wetland impacts. These wetlands are low- to medium-quality, non-riparian managed pine stands at various stages of rotation. The impacts are from roadway fill and associated mechanized clearing. Planted loblolly pine is the dominant tree species, with varying amounts of red maple, sweetgum, greenbrier, sweetbay and blackberry in the understory depending on the level of maintenance on each individual tract. The herbaceous layer contains sedges, rushes, and numerous fern species. In order to tie a borrow haul road to the project alignment, a detailed study of the southern boundary of the wetland delineation was performed, which resulted in a change in the wetland boundary from Station 221+00 to 246+50. This change was confirmed by the USACE on August 23, 2005.

**Site 11 (Sta 264+20 to 267+00)** involves the fill of a 0.07 acre pond and piping 180 feet (0.01 ac) of intermittent unimportant stream under the roadway. This 5' wide ditch is a G Rosgen-type stream with a loamy substrate. An additional 31 feet of channel will be impacted temporarily to tie in the proposed ditches and retain the current surface water flow.

**Site 12 (Sta 267+30 to 298+40)** consists of 6.72 acres of impact to low- and medium-quality, non-riparian wetlands currently under silviculture management. Portions of this impact are linear wetland features (man-made ditches) that are connected to larger jurisdictional wetlands. (see Site 10 for wetland description)

**Site 13 (Sta 299+20 to 314+70)** includes fill and mechanized clearing impacts to 4.59 acres of scrub-shrub wetlands. This wetland was characterized as emergent in the NRTR after clear

cutting, but is now reverting back to scrub-shrub with dominant vegetation consisting of red maple, sweetgum, blackberry, greenbrier, sedges and rushes.

**Site 14 (Sta 315+00 to 370+30)** is the largest of the impact sites with 30.66 acres of permanent wetland fill and mechanized clearing and 1.30 acres of temporary wetland impacts. This site is at the interchange with Wakelon Road, and includes total takes of wetlands internal to the interchange in quadrants C and D. Additional mechanized clearing is provided within the interchange to provide site distance for merging with oncoming traffic. Wetlands within quadrant A are not considered a total take, as agreed upon in the 4C concurrence meeting, due to their large size and since this area is not supplied by overbank flow. The impacted wetlands are a mix of low-quality forested, scrub-shrub and emergent wetlands that have been degraded due to forestry practices. The temporary wetland impacts are immediately adjacent to the permanent wetland impacts, and are due to the proposed on-site detour of Wakelon Road. The temporary impact area will be graded to original contours and reforested as shown in the attached plans and reforestation detail. The site also contains a 0.10 acre pond that will be drained and partially filled. (see Sites 10 and 13 for wetland descriptions)

**Site 15 (Sta 375+50 to 380+20)** is a 0.62 acre fill and mechanized clearing impact to a non-riparian, low-quality, scrub-shrub wetland. (see Site 13 for wetland description)

**Site 16 (Sta 397+30 to 428+90)** consists of 9.29 acres of impacts from roadway fill and mechanized clearing to medium- and low-quality forested, scrub-shrub and emergent wetlands that are under various stages of silviculture management. (see Sites 10 and 13 for wetland descriptions)

**Site 17 (Sta 466+50 to 470+10)** is 0.81 acre of low-quality, emergent/scrub-shrub wetland impact due to fill and mechanized clearing. This site is near the eastern end of the project and is not considered a total take since it drains off to the south and the wetland equalizer pipe should retain the hydrology on the north side of the road. (see Site 13 for wetland description)

**Site 18 (-Y5- Sta 35+10 to 35+50)** is located along the new alignment of Greens Cross Road south of the proposed US 17 Bypass. This site includes less than 0.01 acre of wetland fill and mechanized clearing in a low-quality scrub-shrub wetland. (see Site 13 for wetland description)

**Site 19 (-Y5- Sta 41+60 to 42+80)** is 0.07 acre of impact to a low-quality linear wetland approximately 600 feet east of Site 18 along the Greens Cross Road re-alignment. (see Site 13 for wetland description)

## PROTECTED SPECIES

Plants and animals classified as Endangered or Threatened by the U.S. Fish and Wildlife Service (USFWS) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. Table 5 presents the USFWS list of federally protected species for Bertie County, North Carolina as of January 29, 2003.

**Table 5: Federally-Listed Protected Species for Bertie County, NC \***

Scientific Name	Common Name	Federal Status
<i>Haliaeetus leucocephalus</i>	Bald eagle	Threatened – Proposed for Delisting
<i>Picoides borealis</i>	Red-cockaded woodpecker (RCW)	Endangered
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered

\* Amended to include those species listed by the NC Natural Heritage Program to occur in Bertie County

Surveys for RCW were performed for the original NRTR. A biological conclusion of “No Effect” was reached for this species. On May 19, 2004, USFWS issued a letter of concurrence stating that the Service concurs that this project will have “No Effect” on RCW populations. Minor changes to the roadway alignment have occurred during final design. All changes are within the area covered by the original survey.

The bald eagle, although not listed for Bertie County by the USFWS, is shown as occurring within Bertie County by the North Carolina Natural Heritage Program element occurrence database. No suitable habitat exists for the bald eagle within the project area, with the exception of the Cashie River. Surveys for bald eagles and their nests have been performed at the location of the bridge crossing. No occurrences of this species were noted on the site. Suitable habitat within the project area will be resurveyed prior to construction.

While the shortnose sturgeon is also listed by NCNHP for Bertie County, no surveys have been performed for this species. The construction moratoria for in-water work, which lasts from February 15 to September 30, will limit potential for impacts to this and other anadromous species. Moratoria conservation measures, to be used during construction in non-inundated wetland areas, will include using silt fence to completely contain the construction zone, using a turbidity curtain to separate the construction area from the Cashie River, and implementation of these two measures prior to commencement of the moratorium. The top-down construction method used for the dual bridges will also serve to limit temporary impacts to these waters by eliminating the need for a workbridge or other construction access.

### CULTURAL RESOURCES

The proposed project will impact two archaeological sites (Sites 31BR192\*\* and 31BR201/201\*\*) eligible for listing on the National Register of Historic Places. The State Historic Preservation Office (SHPO) concurred with the eligibility of these two sites on July 16, 2002. Preparation of a Memorandum of Agreement for Recovery of Significant Information from Archaeological Sites 31BR192\*\* and 31BR201/201\*\* is in process and will be completed and signed prior to the project construction. Upon completion of the Data Recovery efforts, the NCDOT will prepare and forward a Management Summary to the SHPO detailing the results of the Data Recovery field investigations. The Management Summary will contain sufficient information to demonstrate that the field investigation portion of the Data Recovery Plan has been implemented. Upon acceptance of the recommendations contained in the Management Summary, the SHPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed. Staging and borrow areas outside the original study limits

are currently being reviewed for archaeological resources by a qualified subcontractor. The results of these surveys will be submitted to NCDOT and SHPO for review and concurrence prior to construction.

### **STAGING, BORROW, AND WASTE AREA IMPACTS**

As required for projects in the design-build process, staging areas, borrow and waste areas, and haul road impacts have been identified prior to the submission of the permit application. All staging and waste areas will be located entirely in uplands. Eight borrow areas are still under consideration, of which six will likely be used for this project (as shown in the attached site location map and on Exhibit A). These borrow areas will not impact jurisdictional resources under Section 404 of the Clean Water Act. However, the borrow site located south of Greens Cross Road near the center of the project contains two small (0.66 acre total) isolated wetlands. These wetlands were formed during the timber management of the site due to plowing across the natural drainage pattern and burn-debris piles that caused compaction of the soils. The USACE verified that these wetlands are isolated, and an isolated wetlands addendum is attached for NCDWQ review. This impact is necessary to avoid using an alternate borrow source that would involve construction of a haul road through high quality wetlands. Instead, the proposed borrow site allows for the use of the existing timber haul road with minor widening and much less impact. This justification is further detailed in the Isolated Wetlands Addendum.

Haul road impacts for the borrow site discussed above are included in the impact summary. Exhibit B presents the location of the haul roads and the impacts associated with its improvements. The impacts are limited to 0.02 acres of temporary fill and a pipe extension along 49 linear feet of perennial stream channel. Haul road impacts will be temporary, and the areas will be regraded to original contours and reforested when the project is completed. Stream banks will be returned to existing conditions and revegetated. A reforestation detail is provided within this permit application. The only other haul road impact is at Site 1 through the pond that will be drained for roadway construction. These impacts have been included in the permit impact calculations and are shown on the attached plans. The borrow pit designated as IP#3 and presented in the 4C concurrence meeting is not included in this permit and will not be used. It has been dropped from consideration due to the presence of wetlands within the furrows on the site. This eliminates over one-quarter acre of temporary wetland impacts and two perennial stream crossings associated with the improvement of a haul road from the site.

### **UTILITY IMPACTS**

Utility impacts have been accounted for within the attached permit impact sheets and the impact summary tables within this document. Several utilities will be relocated due to the construction of R-2404A. These include overhead power lines, sewer force main, water lines, gas lines, telephone, and cable. These relocations occur along the existing US 13/17 alignment (Sites 1, 2, 3, 4), Greens Cross Road (Sites 9, 18, 19), Wakelon Road (Site 14), and the tie in with the existing US 17 north of Windsor. The utility relocation will be coordinated with the roadway construction, and there will be no additional impacts due to these activities. At Sites 1, 2, 3, 4, 9, 18, and 19, the utilities will be relocated within the proposed slope stake limits in the

jurisdictional areas. At Site 14, the Wakelon Road interchange utilities will either be located within the slope stake limits or directionally bored under the entire interchange area. At the tie in with existing US 17 at the end of the project, there will be no utility relocation within jurisdictional areas.

### **FEMA COMPLIANCE**

A detailed study has been performed on the Cashie River. The dual bridges will span the river, floodplain, and associated wetlands. The design of the structures will not cause a rise in flood elevations along the Cashie River. The project has received approval of the “no-rise” certification.

### **MITIGATION**

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the Waters of the United States. Mitigation of wetland and surface water impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Executive Order 11990 (Protection of Wetlands) and Department of Transportation Order 5660.1A (Preservation of the Nations Wetlands) emphasize protection of the functions and values provided by wetlands. These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

As previously stated, R-2404A has been designed to incorporate all reasonable and practical design features to avoid and minimize impacts to jurisdictional areas. Avoidance measures were taken during the planning and design processes. Minimization measures were implemented during the design phase to include the examination of appropriate and practicable steps to reduce adverse impacts from the project.

### **Avoidance**

The following measures were taken during the planning and design phase of the project, or will occur during the construction of the project to avoid impacts to jurisdictional areas:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- 1,700-foot dual bridges will be built using top-down construction to avoid filling within the extensive bottomland wetland system along the Cashie River (Site 7).

- The proposed top-down construction method will eliminate the need for a temporary work bridge or other access method through the bottomland wetlands at the Cashie River.
- At the Wakelon Road interchange, the ramp in quadrant B was removed and a loop added to quadrant A to accommodate this traffic movement and avoid any impacts to the wetlands in quadrant B.
- The tie-ins to existing US 17 at the beginning of the project have been designed to avoid impacting the two existing box culverts under US 17 and South Granville Street (-Y1- and -Y1A-).
- The construction of new ditches within or adjacent to wetlands has been avoided by using 4 to 6 feet of fill for the entire project. This fill allows bridging of wetland soils or other poor material and eliminates the need to undercut or create ditches within the wetlands.
- Orange silt fencing will be installed around all jurisdictional areas (wetlands and streams) that will not be impacted by the project. This will aid in preventing inadvertent trespass by construction personnel or equipment.

### Minimization

Minimization includes the examination of appropriate and practicable steps to reduce any adverse impacts. Minimization techniques were implemented as follows:

#### ◆ **General Minimization Measures**

- Although not a requirement of the Merger 01 commitments, the proposed design provides sediment and erosion control measures equal to the requirements of High Quality Waters regulations. This includes design of the sediment and erosion control devices to accommodate a 25-year storm event rather than the standard 10-year storm.
- Special sediment control fence, consisting of 57-stone and chicken wire with filtration fabric, will be used in wetland areas to prevent sediment from the project site from entering undisturbed wetland areas. This fence will be placed at the toe of fill slopes, as noted on the plans, and will be underlain by fabric to aid in the removal of the stone upon project completion (a drawing detail is attached). The fence is not shown on the permit impact sheets, since final placement of the fence will be based on site conditions. However, the fencing will be limited to the toe of slope and completely contained within the first five feet of the mechanized clearing areas, which are already accounted for in the permit.
- Throughout the large pine-plantation wetland areas (Sites 10, 12, 13, 14, 16 and 17) 36" wetland equalizer pipes will be installed approximately every 500 feet. These pipes will help to retain the existing hydrology of the adjacent wetlands. The pipes will also be constructed one foot below grade to allow small animal and amphibian passage through the pipes. Due to the low flow of these pipes, endwalls and riprap have been eliminated, which further reduces impacts.
- At both interchange locations, wetlands and streams internal to the interchange are being retained to the greatest extent practical. This includes the installation of wetland equalizer pipes under the ramps and loops at -Y6-. Although some of these areas were determined to be total takes in the 4B and 4C meetings, the proposed design retains as much of the function as possible at these locations (discussions of site-by-site total takes are in the Wetland and Stream Impacts section beginning on page 5).

- Fill slopes in wetlands will be at a 3:1 ratio at all jurisdictional areas per the ROD requirements.
- No new ditches will be constructed within or adjacent to wetlands. Existing ditches that will be relocated during the construction of R-2404A will be built to the existing depths and along the closest alignment to the current ditches to avoid changing the hydrology of the adjacent wetlands.
- The project has been designed with a 46-foot median width to minimize lateral encroachment in wetlands. In addition, the roadway has been designed to allow for future expansion within the median rather than to the outside of the roadway.
- Where practical (based on topography, pipe size, and flows) pre-formed scour holes are designed at stormwater outlets adjacent to wetlands. This provides sheet flow at these locations and avoids additional impacts to the wetlands along the project.
- The stormwater drainage system has been designed to provide frequent low-flow outlets rather than a few major outlets which could lead to off-site erosion and degradation of downstream habitats. The system outlets into the wetland equalizer pipes where practical to avoid additional outlets.

◆ **Site-Specific Minimization Measures:**

- **Site 1:** The existing culvert endwall will be extended on the downstream side of the road to avoid any impacts in that area. Temporary impacts to wetlands will be avoided by locating the stilling basin for the construction of the culvert extension within the permanent impact area of the roadway fill. Filling of the larger pond eliminates the need for a driveway pipe under the proposed haul road. This avoids additional impacts due to the installation of the pipe below the road in the undisturbed wetlands adjacent to the stream.
- **Site 2:** Wetland fill was avoided and mechanized clearing limits were minimized along the western slope-stake line. Total avoidance of these impacts was not achieved since it would result in additional impacts to the unimpacted wetlands east of the road. The proposed ditch running north along the eastern edge of the corridor was pulled back to avoid impacting the wetland; this flow dissipates into uplands prior to entering the wetland.
- **Site 3:** Wetland fill was avoided other than the small amount required at the pipe extension. Only a minor amount of mechanized clearing will occur within the main body of the wetland system. These impacts are unavoidable due to the requirement to maintain access to the commercial properties on the east side of the road.
- **Site 4:** The following minimization measures were used at this site:
  - The major minimization effort at this site was achieved by lowering the roadway elevation. An alternative of raising the -Y- line grade over the -L- line was evaluated, but this would have increased wetland impacts to the high quality wetland system upgradient of the interchange as well as required an on-site detour.
  - The alignment was shifted slightly approaching Site 4, which helped to avoid and minimize wetland impacts.
  - Ramp B will be shifted out, widened slightly, and used as a temporary two-way detour during construction to avoid additional impacts from on-site detours and to improve traffic control and public safety.

- Impacts to the perennial stream and high quality wetlands upgradient of the roadway were minimized by tying the ditch in Quadrant B into the intermittent stream channel prior to entering the perennial stream. The ditch is designed to collect the offsite drainage at the proposed toe of slope and discharge it to the stream and wetland system at low velocity. Avoidance of this ditch would likely lead to degradation of the fill slope and erosion within the wetland system and stream channels.
- Wetlands and stream channels internal to the interchange will be retained and protected to the greatest extent possible.
- Stormwater detention is provided within Quadrant D of the interchange in order to maximize retention while minimizing impacts to wetlands and streams.
- **Site 5:** The use of a retaining wall was evaluated at this location to avoid impacting the bottomland wetlands. This wall would actually have led to increased impacts due to the necessity of undercutting the wetland soils during construction of the wall. The wall would have also required guardrail construction and 3 feet of extra shoulder due to public safety measures. A minor amount of wetland fill is proposed to avoid the costs and additional impacts associated with a wall.
- **Site 7:** The following minimization efforts were achieved at the bridge location:
  - A construction moratorium will be in place from February 15 to September 30 for work in bottomland wetlands inundated by flow from the Cashie River.
  - Conservation measures will be used during the Cashie River bottomland wetlands construction moratorium, including use of silt fence to isolate any construction areas, use of a turbidity curtain between the River and the construction zone, and implementation of these measures prior to the start of the the moratorium period.
  - The number of piles per bent for the bridge was reduced from 8 to 6, with the exception of four bents that require 7 piles for structural integrity. This resulted in a reduction of permanent wetland impacts.
  - Top-down construction method will be used so that temporary impacts from the construction of a work bridge will not be necessary.
  - The top-down construction will also reduce temporal impacts at this site by reducing the amount of time spent on construction within the wetland system.
  - Hand clearing will be performed under the Cashie River bridges and limited to the minimum clearance required for the crane during construction (25 feet on either side).
  - Standard riprap protection of the upland slopes below the bridge will be used, however no excavation or disturbance except for hand clearing will be required on the slopes.
  - The use of driven H-piles for the bridge piers will greatly reduce the amount of actual construction time and disturbance in the wetlands compared to drilled piers.
  - Deck drains are located more than 100' beyond the 30' CAMA buffer around the public trust waters.
  - Deck drains have been spaced at 6 foot intervals and reduced to 4 inch diameter to reduce the concentrated flows during the design storm.
  - Stormwater on the remaining bridge surface (without deck drains) will be routed to two pre-formed scour holes with vegetated filter strips located equidistant from any surface water bodies. This provides the greatest amount of treatment possible prior to entering the surface waters.

- **Site 9:** The existing -Y- line roadway (Greens Cross Road) will be used as the on-site detour in order to minimize wetland impacts.
- **Site 12:** The existing ditch at Sta 295+00 to 297+00 will be replaced with a similar ditch along the toe of the roadway fill. The bottom elevation of the proposed ditch will be the same as the existing one in order to avoid any draining of the adjacent wetlands.
- **Site 13:** The existing roadside ditch between Sites 13 and 14 will be replaced by lateral V-ditches at the same bottom elevation as the existing ditches. This will retain the existing roadside hydrology and prevent draining of the adjacent wetlands.
- **Site 14:** As agreed upon in the 4A meeting, Loop A was added and Ramp B removed in order to minimize impacts to the larger wetland system. Wetlands within quadrant A will be retained, using equalizer pipes to aide in maintenance of hydrologic equilibrium. A temporary detour required at this intersection was located adjacent to permanent impacts in Quadrants A and D in order to minimize the detour's impact area and avoid additional impacts in Quadrant B. The additional mechanized clearing within the loop is required for sight distance and safety of the traveling public.
- **Site 15:** The alignment was shifted as far north as possible in order to minimize impacts to this wetland.
- **Site 17:** An equalizer pipe will be installed at this location in order to retain the hydrology in the upper portion of the wetland. This, along with the off-site drainage from north of the roadway will allow this system to retain its function.

### **Compensation**

The primary emphasis of compensatory mitigation is to reestablish a condition that would have existed if the project were not built. As previously stated, mitigation is limited to reasonable expenditures and practicable considerations related to highway operation. Mitigation is generally accomplished through a combination of methods designed to replace wetland functions and values lost as a result of construction of the project. These methods consist of creation of new wetlands from uplands, borrow pits, and other non-wetland areas; restoration of wetlands; and enhancement of existing wetlands. Where such options may not be available, or when existing wetlands and wetland-surface water complexes are considered to be important resources worthy of preservation, consideration is given to preservation as at least one component of a compensatory mitigation proposal.

**FHWA Step Down Compliance:** All compensatory mitigation must be in compliance with 23 CFR Part 777.9 (Mitigation of Impacts), which describes the following actions to qualify for Federal-aid highway funding. This process is known as Federal Highway Administration "Step Down" procedures described in the following points:

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pits, interchange areas, and along the roadside.
2. When mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including creation, restoration, enhancement and preservation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the EEP will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects. The offsetting mitigation will be derived from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 68.56 acres of jurisdictional wetlands (4.05 acres of riparian wetlands and 64.51 acres of non-riparian wetlands), 0.66 of isolated wetlands, and 1,354 feet of jurisdictional important streams will be offset by compensatory mitigation provided by EEP. A copy of the EEP acceptance letter is included with this application.

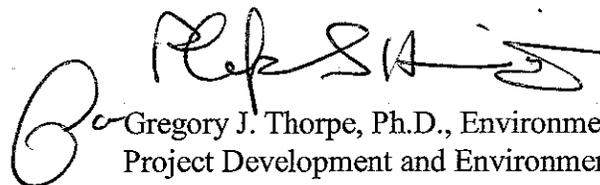
Initial surveys for on-site mitigation opportunities were performed by NCDOT. The results were identified in the Final EIS for the project. Several potential mitigation sites within the proximity to the project were further evaluated, but no feasible on-site mitigation opportunities resulted. Therefore, no on-site mitigation is proposed for R-2404A. Through avoidance and minimization described above, wetland impacts have been reduced from the ROD by 60 acres, and stream impacts requiring mitigation have been reduced by 806 linear feet from the May 2005 revised stream calculations.

#### **REGULATORY APPROVALS**

This application is hereby made for a CAMA Major Development Permit for the construction of R-2404A. NCDOT is applying for a Clean Water Act Section 404 Individual Permit, Section 401 Water Quality Certification, and Isolated Wetlands Permit under separate cover. In compliance with Section 143-215.3D(e) of the NCAC and 15A NCAC 07J.0204b(6A) NCDOT will provide \$475.00 to act as payment for processing the CAMA Application and 401 Certification as previously noted in this application.

If you have any questions or need additional information, please call Mr. Chris Rivenbark at (919) 715-1460 or via email at [crivenbark@dot.state.nc.us](mailto:crivenbark@dot.state.nc.us).

Sincerely,



Gregory J. Thorpe, Ph.D., Environmental Management Director  
Project Development and Environmental Analysis Branch

CC with attachments:

Mr. John Hennessy, NCDWQ (7 copies)  
Mr. Travis Wilson, NCWRC  
Ms. Becky Fox, USEPA – Whittier, NC  
Mr. Ronald Mikulak, USEPA – Atlanta, GA  
Mr. Clarence W. Coleman, P.E., FHWA  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Michael Street, NCDMF  
Ms. Cathy Brittingham, NCDCM  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. Don Conner, P.E., Division 1 Engineer  
Mr. Clay Willis, Division 1 Environmental Officer

CC without attachments:

Mr. Bill Biddlecome, USACE – Washington, NC  
Mr. Scott McLendon, USACE – Wilmington, NC  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Ms. Beth Harmon, EEP  
Mr. Todd Jones, NCDOT External Audit Branch  
Ms. Stacy Baldwin, P.E., PDEA  
Mr. Carl Goode, P.E., Human Environment Unit Head  
Mr. Roger Rochelle, P.E., Design Services



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

September 13, 2005

U. S. Army Corps of Engineers  
Regulatory Field Office  
Post Office Box 1000  
Washington, NC 27889-1000

Attn: Mr. William J. Biddlecome  
NCDOT Coordinator

Dear Mr. Biddlecome:

Subject: **Application for Section 404 Individual Permit Application** for the proposed Windsor Bypass. US 17 from US 13-17 to East of SR 1503 (Davis Road). Bertie County. Contract ID No. C201236. TIP No. R-2404A. W.B.S. 34424.3.7

The North Carolina Department of Transportation (NCDOT) proposes to improve existing U.S. Highway 17 (US 17) to a high speed, multi-lane highway that bypasses the Town of Windsor (R-2404A). The purpose of the project is to improve mobility through Bertie County on US 17 without delays caused by local traffic. The project will include 2.3 miles of existing road widening from 2 to 4 lanes and 7.3 miles of new alignment 5-lane divided highway, including dual 1,700-foot bridges crossing the Cashie River. The design-build project is scheduled to begin construction in January 2006 and to be completed by June 2008.

The purpose of this document is to submit this final design for approval and to request approval of a Clean Water Act Section 404 Individual Permit, Section 401 Water Quality Certification, and Coastal Area Management Act (CAMA) Major Development Permit. Included in this application package are the following: (1) CAMA Major Development Permit Application forms, (2) property owner certified mail delivery receipts, (3) ENG Form 4345 Application for Department of the Army Permit, (4) Isolated Wetlands Addendum for impacts at a proposed borrow area, (5) stormwater management plan, (6) Merger 01 4B and 4C meeting minutes, (7) North Carolina Ecosystem Enhancement Program (EEP) acceptance letter, (8) vicinity and site maps, (9) list of property owners, (10) permit impact summary table, (11) half-size permit impact sheets, and (12) a full set of roadway plans.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1548 MAIL SERVICE CENTER  
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141  
FAX: 919-733-9794

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Preliminary geotechnical borings for R-2404A were permitted under a Nationwide Permit No. 6 in July 2004 (Action ID 1994000453) and completed in October 2004. No additional fieldwork on this project has occurred, with the exception of surveying, right-of-way acquisition, and environmental and engineering field reviews. No staging of materials or construction will occur until all permits have been approved by the respective regulatory agencies. Site-specific data such as quality and classification information for wetlands and streams is derived from the Natural Resources Technical Report (NRTR), which was prepared in May 2002 for NCDOT and TGS Engineers by Environmental Services, Inc. Additional recent field reconnaissance was performed to update the NRTR's data, and is noted below.

### Summary of Impacts

Table 1 lists all proposed impacts associated with the construction of R-2404A. These impacts are detailed by site in the Resource Impacts section of this document.

*Table 1: Summary of Impacts*

<b>Permanent Wetland* (acres)</b>	<b>Temporary Wetland^ (acres)</b>	<b>Isolated Wetlands (acres)</b>	<b>Streams^ (linear feet)</b>	<b>Streams Requiring Mitigation (lf)</b>	<b>Surface Waters# (acres)</b>
<b>68.56</b>	<b>1.32</b>	<b>0.66</b>	<b>2,035</b>	<b>1,354</b>	<b>1.06</b>

\* Wetland impact calculations include fill, excavation, and mechanized clearing; difference from permit impact summary sheet is due to inclusion of borrow/haul road impacts.

^ Difference from permit impact summary sheet is due to inclusion of haul road impacts.

# Surface water calculations include ponds and streams without mitigation requirements; difference from permit impact summary sheet is due to rounding to two decimal places at each site.

The Cashie River and associated bottomland wetland system will be bridged using dual 1,700-foot structures. Temporary impacts necessary for the on-site roadway detours and haul roads are included in the impact calculations and discussed below. Utility relocation impacts have also been assessed and are included with this permit application.

### Summary of Mitigation

On-site mitigation opportunities have been fully evaluated, as described later in this document. Avoidance and minimization measures have been maximized to the greatest practical extent throughout the planning and design effort. The remaining unavoidable impacts will be mitigated through the EEP. It is anticipated that the following impacts will require mitigation:

- 4.05 acres (ac) of Riparian Wetlands,
- 64.51 acres of Non-riparian Wetlands,
- 0.66 acres of Isolated Wetlands, and
- 1,354 linear feet (lf) of Important Stream Channel.

## **RESOURCE STATUS**

The Cashie River is located in the Roanoke River Basin (USGS Hydrologic Unit 03010107, NCDWQ Subbasin 03-02-10). The best usage classification for the Cashie River (NCDWQ Index No. 24-2-(1)) is Class C-Sw from its source to a point 1 mile upstream of SR 1500 in Bertie County. The River is listed as partially supporting its best usage classification due to a statewide fish (bowfin) consumption advisory. The River is also included in North Carolina's 2002 Section 303(d) List, and in the current 2004 draft list, as impaired due to this fish consumption advisory. The River is not listed in the National Wild and Scenic Rivers System maintained by the National Park Service. No High Quality Waters, Water Supply Waters, or Outstanding Resource Waters are located within 1 mile of the project.

## **NEPA DOCUMENT STATUS**

This project has completed the Merger 01 Process. Several meetings were held by NCDOT and the respective regulatory agencies to determine the Least Environmentally Damaging Practical Alternative (LEDPA) and bridge sites. The results of these meetings were incorporated into the Final Environmental Impact Statement, which was approved on August 29, 2003. A Record of Decision (ROD) was issued on August 26, 2004. All commitments in the ROD were complied with during the preparation of the final design.

No additional impact areas or significant changes to the right-of-way or roadway alignment have occurred since the completion of the ROD. Therefore, no additional NEPA documentation is required for the project. All borrow and staging areas have been evaluated by qualified consultants for jurisdictional waters under the Clean Water Act, federally protected species, and archaeological resources. There will be no impacts to any of these resources from borrow/staging activities or haul roads related to this project, except as noted in the following documentation.

## **RESOURCE IMPACTS**

The following section describes the issues related to proposed impacts to jurisdictional wetlands and streams associated with R-2404A. The final plans showing the projected impacts are attached. Site-specific avoidance and minimization techniques are detailed below in the Mitigation section. Table 2 presents a summary of these impacts, while a detailed breakdown of the proposed impacts is attached with the permit impact sheets. Tables 3 and 4 present detailed descriptions of the status and quality of each of the impact sites.

**Table 2: Summary of Impact Sites**

Site No.	Permanent Wetland* (ac)	Temporary Wetland (ac)	Streams (lf)	Streams Requiring Mitigation (lf)	Surface Waters^ (ac)
1	0.38	0	286	89	0.76
2	0.01	0	39	0	0.01
3	0.02	0	0	0	0
4	3.61	0	1,450	1,265	0.10
5	0.06	0	0	0	0
6	0.26	0	0	0	0
7@	0.00	0	0	0	0
8	0.28	0	0	0	0
9	0.19	0	0	0	0
10	10.98	0	0	0	0
11	0.00	0	211	0	0.09
12	6.72	0	0	0	0
13	4.59	0	0	0	0
14	30.66	1.30	0	0	0.10
15	0.62	0	0	0	0
16	9.29	0	0	0	0
17	0.81	0	0	0	0
18	0.01	0	0	0	0
19	0.07	0	0	0	0
IP#1 #	0.66	0.02	49	0	0
<b>Total</b>	<b>69.22 ac</b>	<b>1.32 ac</b>	<b>2,035 lf</b>	<b>1,354 lf</b>	<b>1.06 ac</b>

\* Wetland impact calculations include fill, excavation, and mechanized clearing; difference from permit impact summary sheet is due to inclusion of haul roads and rounding to two decimals at each site.

^ Surface water calculations include ponds and streams without mitigation requirements;

@ Site is bridged - 0.01 acres of wetland impacts from piles not included in totals.

# Borrow area impacts not shown on permit impact summary sheet (see Exhibit B). Permanent impacts to isolated wetlands only.

**Table 3: Jurisdictional Stream Information**

Site No.	Station Number	Impact Structure *	Stream Name #	DWQ Index No.	Stream Status ^	Impact (lf)	Required Mitigation (lf)
1	L 44+50	8x6 RCBC	UT to Cashie R.	24-2-(1)	P	89	89
2	L 85+40	48" RCP	UT to Cashie R.	24-2-(1)	IU	39	0
4	L 138+10	36" RCP	UT to Cashie R.	24-2-(1)	P / IU	1,450	1,265
11	L 264+50	36" RCP	UT to Hoggard Mill Creek	24-2-6	IU	211	0

\* Structures: Reinforced concrete box culvert (RCBC), Reinforced concrete pipe (RCP);

# Unnamed tributary (UT); ^ Stream status: Perennial (P), Intermittent Unimportant (IU)

**Table 4: Jurisdictional Wetland Information**

Site No.	Riparian/ Non-riparian <sup>^</sup>	Cowardin Classification <sup>^</sup> #	Impact Type(s)*	Wetland Quality <sup>^</sup>	Impact Acreage
1	Riparian	PEM / PFO	F / E / M	Medium	0.38
2	Non-riparian	PFO	M	Low	0.01
3	Non-riparian	PFO	F / M	Medium	0.02
4	Riparian	PFO	F / E / M	Low/Medium/High	3.61
5	Riparian	PFO	F / M	High	0.06
6	Non-riparian	PFO	F / M	Low	0.26
8	Non-riparian	PSS / PFO	F / M	Low	0.28
9	Non-riparian	PFO	F / E / M	Low	0.19
10	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	10.98
12	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	6.72
13	Non-riparian	PEM	F / M	Low	4.59
14	Non-riparian	PEM / PSS / PFO	F / M	Low	30.66
15	Non-riparian	PSS	F / M	Low	0.62
16	Non-riparian	PEM / PSS / PFO	F / M	Low/Medium	9.29
17	Non-riparian	PEM	F / M	Low	0.81
18	Non-riparian	PSS	F / M	Low	0.01
19	Non-riparian	PSS	F / M	Low	0.07

<sup>^</sup> Based on NRTR-provided data;

<sup>#</sup> Classification Types: Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), Palustrine Forested (PFO);

\* Impact Types: fill (F), excavation (E), and mechanized clearing (M)

### Delineations

Wetland and stream delineations were conducted from June through August 2001 using the 1987 US Army Corps of Engineers (USACE) methodology. Representatives from the USACE Washington Regulatory Field Office verified the wetland delineation on September 6 and October 30, 2001. Stream delineations were verified by the USACE on October 30 and November 9, 2001. The delineations and corresponding verifications are valid through the same dates in 2006. On May 25, 2005, a representative from the USACE Washington Regulatory Field Office concurred with adjustments to the stream channel status at Sites 1 and 4. These changes were incorporated into the plan set and discussed in the Concurrence Point 4C meeting (see attached meeting minutes). On August 23, 2005 an adjusted southern wetland boundary at Site 10 was field verified by the USACE. Borrow area delineations were also field verified by USACE representatives on May 25 and August 23, 2005.

### Wetland and Stream Impacts

The vast majority of proposed wetland impacts occur along the eastern half of the project at Sites 10, 12, 13, 14, and 16 (see Table 4 above). These proposed impacts occur mainly in low quality non-riparian wetlands that are currently at various stages of silviculture management (recent clearcuts, newly planted pine stands, maturing pine plantations, etc.). Stream impacts occur at

four sites: 1, 2, 4 and 11. Streams requiring mitigation occur at Sites 1 and 4. A site-by-site description of impacts follows:

**Site 1 (Sta 41+50 to 49+00)** has impacts to 89 linear feet of perennial stream, 197 linear feet of intermittent unimportant stream, 0.38 acre of associated emergent and forested wetlands, and 0.76 acre of surface water including two ponds. A roadside ditch at Station 51+00 Rt, presented in the original mapping as a stream channel, was determined not to be under Section 404 jurisdiction by the USACE. The intermittent unimportant stream reach is a 1.5' wide, C/G Rosgen-type stream with a loamy substrate and somewhat poorly-defined channel. The perennial stream is a 20' wide channelized reach that is classified as a C/E Rosgen-type stream and is typically ponded. The emergent wetlands are dominated by Polygonum (*Polygonum* spp.), jewelweed (*Impatiens capensis*), and lizard's tail (*Saururus cernuus*), and the forested wetlands by red maple (*Acer rubrum*) and various young hardwoods and shrubs. These impacts are due to the culvert extension on the upstream side of the road and fill slopes required for the roadway widening. The culvert extension impacts the perennial stream channel in a section that is typically ponded and has relatively low flows. As agreed upon in Concurrence Point 4B, the existing culvert will be extended with the bottom of the extension at the stream bed channel rather than embedded one-foot. This is necessary since the existing culvert inlet is on the stream bed, and the potential for headcutting upstream if the culvert extension were embedded. The intermittent stream reach and emergent and forested wetlands will be filled as a result of the road widening. The two ponds, the larger of which has no upgradient jurisdictional features, are considered total takes due to draining. The ponds require draining since the embankments will be within the proposed right-of-way (ROW) for the project. A portion of the smaller pond will be filled for roadway construction. Due to the need for a haul road through the larger pond, as well as the required roadway fill, the entire pond will be filled and graded to drain to the existing cut ditch. Filling this pond eliminates the need for a driveway pipe and additional wetland/stream impacts at this location.

**Site 2 (Sta 85+10 to 88+00)** has 0.01 acre of impact to low quality, forested wetlands due to mechanized clearing. A pipe extension is also proposed that impacts 39 linear feet of intermittent unimportant stream channel. The wetland is dominated by broad-leaved deciduous vegetation, including red maple, sweetgum (*Liquidambar styraciflua*), and swamp tupelo (*Nyssa biflora*), with little to no shrub or herbaceous layer. The stream is a G Rosgen-classified reach that is 4' wide and appears to have been channelized.

**Site 3 (Sta 115+60 to 117+90)** has 0.02 acre of forested wetland impacts due to a pipe extension and mechanized clearing on the upstream side of the roadway. This wetland is an inundated hardwood forest containing swamp tupelo, red maple, bald cypress (*Taxodium distichum*), and sweetbay (*Magnolia virginiana*).

**Site 4 (Sta 129+00 to 141+80)** is located at the major interchange on the project and includes a total of 3.61 acres of fill in medium- and high-quality forested wetlands. This impact includes total takes of the wetland areas internal to the interchange in quadrants A and D. The total take areas are discussed by site and included in the calculations, but are not shown as impacts on the plan sheets to prevent unintentional encroachment into these areas. This site also includes 1,450

linear feet of stream loss, mainly due to the piping of a perennial stream that currently runs through the existing intersection. This stream loss does not include the segments internal to quadrants A and D, since the adjacent wetland buffers will remain in place to help preserve the existing function of the stream channel. Upgradient of the existing roadway, 157 feet of perennial stream (C Rosgen-type stream with a sandy substrate, approximately 3' wide), 185 feet of intermittent unimportant stream (sand-dominated 3' wide channel that originates at a seep), and 0.21 acres of low- and high-quality wetlands are to be impacted by fill and a drainage ditch. The ditch is required to protect the toe of slope from off-site runoff and ties back into the wetland area to be retained above the roadway. The wetlands above the existing roadway are dominated by broad-leaved deciduous forest (red maple, swamp tupelo, sweetgum, etc.) with some bald cypress interspersed. Downstream of the existing roadway 3.40 acres of medium-quality wetlands and 1,108 feet of perennial streams will be impacted by roadway fill and requisite piping. The northernmost channel is a 3' wide, F Rosgen-class stream with a sandy substrate. The southern reach is a G to E/C Rosgen-type stream that is 4'-5' wide and sand-dominated. The wetlands are very similar to those found at the upstream portion of Site 4.

**Site 5 (Sta 144+00 to 146+10)** is a 0.06 acre impact to high quality wetlands adjacent to the Cashie River. The impacts are due to a small amount of fill and hand clearing along the approach to the bridge location. These impacts are unavoidable due to the geometry of the alignment along the short distance between the US 13 interchange and the bridge location. This wetland is part of the Cashie River cypress-gum bottomland system, which includes numerous broad-leaved deciduous overstory trees with a relatively sparse understory containing sweetbay, slippery elm (*Ulmus rubra*), greenbrier (*Smilax* spp.), sedges (*Carex* spp. and *Cyperus* spp.), rushes (*Juncus* spp.), and numerous fern species.

**Site 6 (Sta 149+00 to 153+50)** is a 0.26 acre fill and clearing of a low-quality wetland that is adjacent to an existing borrow pit. This fill is caused by the roadway fill approaching the bridges over the Cashie River. The wetland is a broad-leaved deciduous forest dominated by red maple, sweetgum, blackberry (*Rubus* spp.) and greenbrier. A portion (1.18 acres) of the borrow pit (listed as a pond in the NRTR) will also be filled for roadway construction, but this is not considered a surface water loss as it is an active borrow pit within an upland area. The USACE confirmed that this borrow pit is not under Section 404 jurisdiction on August 23, 2005.

**Site 7 (Sta 155+00 to 172+00)** is the dual 1,700-foot bridges over the Cashie River and the adjacent high quality bottomland hardwood swamp (see Site 5 for wetland description). Of the 424 driven bridge piles (H-piles), 392 are located within the wetlands and will have a direct impact on less than 0.01 acre of high-quality riparian wetlands. In addition, the bridge will have a shading effect on 2.53 acres of wetlands and 127 linear feet (0.41 acre) of the Cashie River. The bridge is a cored slab structure with thirty-four 50-foot spans built using top-down construction. Hand clearing will be performed in 5.02 acres of the forested wetlands under the bridge and on 25 feet to either side to allow for the swing of the crane booms.

**Site 8 (Sta 175+80 to 180+00)** is a 0.28 acre fill and mechanized clearing of a linear, low-quality wetland drainage. No cross pipe is required to the wetland south of the road since there is a ridgeline that separates these wetland features. The wetland is characterized by a mix of

deciduous forest and scrub-shrub vegetation, including red maple, sweetgum, green ash (*Fraxinus pennsylvanica*), sweetbay, and Chinese privet (*Ligustrum sinense*).

**Site 9 (-Y5- Sta 16+50 to 21+00)** is at the overpass of Greens Cross Road over the proposed roadway. Three areas, totaling 0.19 acre, of low-quality wetland drainages will be impacted due to roadside ditches, fill for roadway construction, temporary fill for an on-site detour, and mechanized clearing. This also includes a small area above the realigned -Y5- at station 21+00 that is considered a total take. These wetlands are dominated by deciduous and evergreen forest, including loblolly pine (*Pinus taeda*), red maple, sweetgum, green ash, and swamp tupelo.

**Site 10 (Sta 217+10 to 258+60)** includes 10.98 acres of wetland impacts. These wetlands are low- to medium-quality, non-riparian managed pine stands at various stages of rotation. The impacts are from roadway fill and associated mechanized clearing. Planted loblolly pine is the dominant tree species, with varying amounts of red maple, sweetgum, greenbrier, sweetbay and blackberry in the understory depending on the level of maintenance on each individual tract. The herbaceous layer contains sedges, rushes, and numerous fern species. In order to tie a borrow haul road to the project alignment, a detailed study of the southern boundary of the wetland delineation was performed, which resulted in a change in the wetland boundary from Station 221+00 to 246+50. This change was confirmed by the USACE on August 23, 2005.

**Site 11 (Sta 264+20 to 267+00)** involves the fill of a 0.07 acre pond and piping 180 feet (0.01 ac) of intermittent unimportant stream under the roadway. This 5' wide ditch is a G Rosgen-type stream with a loamy substrate. An additional 31 feet of channel will be impacted temporarily to tie in the proposed ditches and retain the current surface water flow.

**Site 12 (Sta 267+30 to 298+40)** consists of 6.72 acres of impact to low- and medium-quality, non-riparian wetlands currently under silviculture management. Portions of this impact are linear wetland features (man-made ditches) that are connected to larger jurisdictional wetlands. (see Site 10 for wetland description)

**Site 13 (Sta 299+20 to 314+70)** includes fill and mechanized clearing impacts to 4.59 acres of scrub-shrub wetlands. This wetland was characterized as emergent in the NRTR after clear cutting, but is now reverting back to scrub-shrub with dominant vegetation consisting of red maple, sweetgum, blackberry, greenbrier, sedges and rushes.

**Site 14 (Sta 315+00 to 370+30)** is the largest of the impact sites with 30.66 acres of permanent wetland fill and mechanized clearing and 1.30 acres of temporary wetland impacts. This site is at the interchange with Wakelon Road, and includes total takes of wetlands internal to the interchange in quadrants C and D. Additional mechanized clearing is provided within the interchange to provide site distance for merging with oncoming traffic. Wetlands within quadrant A are not considered a total take, as agreed upon in the 4C concurrence meeting, due to their large size and since this area is not supplied by overbank flow. The impacted wetlands are a mix of low-quality forested, scrub-shrub and emergent wetlands that have been degraded due to forestry practices. The temporary wetland impacts are immediately adjacent to the permanent wetland impacts, and are due to the proposed on-site detour of Wakelon Road. The temporary

impact area will be graded to original contours and reforested as shown in the attached plans and reforestation detail. The site also contains a 0.10 acre pond that will be drained and partially filled. (see Sites 10 and 13 for wetland descriptions)

**Site 15 (Sta 375+50 to 380+20)** is a 0.62 acre fill and mechanized clearing impact to a non-riparian, low-quality, scrub-shrub wetland. (see Site 13 for wetland description)

**Site 16 (Sta 397+30 to 428+90)** consists of 9.29 acres of impacts from roadway fill and mechanized clearing to medium- and low-quality forested, scrub-shrub and emergent wetlands that are under various stages of silviculture management. (see Sites 10 and 13 for wetland descriptions)

**Site 17 (Sta 466+50 to 470+10)** is 0.81 acre of low-quality, emergent/scrub-shrub wetland impact due to fill and mechanized clearing. This site is near the eastern end of the project and is not considered a total take since it drains off to the south and the wetland equalizer pipe should retain the hydrology on the north side of the road. (see Site 13 for wetland description)

**Site 18 (-Y5- Sta 35+10 to 35+50)** is located along the new alignment of Greens Cross Road south of the proposed US 17 Bypass. This site includes less than 0.01 acre of wetland fill and mechanized clearing in a low-quality scrub-shrub wetland. (see Site 13 for wetland description)

**Site 19 (-Y5- Sta 41+60 to 42+80)** is 0.07 acre of impact to a low-quality linear wetland approximately 600 feet east of Site 18 along the Greens Cross Road re-alignment. (see Site 13 for wetland description)

### PROTECTED SPECIES

Plants and animals classified as Endangered or Threatened by the U.S. Fish and Wildlife Service (USFWS) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. Table 5 presents the USFWS list of federally protected species for Bertie County, North Carolina as of January 29, 2003.

**Table 5: Federally-Listed Protected Species for Bertie County, NC \***

Scientific Name	Common Name	Federal Status
<i>Haliaeetus leucocephalus</i>	Bald eagle	Threatened – Proposed for Delisting
<i>Picoides borealis</i>	Red-cockaded woodpecker (RCW)	Endangered
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered

\* Amended to include those species listed by the NC Natural Heritage Program to occur in Bertie County

Surveys for RCW were performed for the original NRTR. A biological conclusion of “No Effect” was reached for this species. On May 19, 2004, USFWS issued a letter of concurrence stating that the Service concurs that this project will have “No Effect” on RCW populations. Minor changes to the roadway alignment have occurred during final design. All changes are within the area covered by the original survey.

The bald eagle, although not listed for Bertie County by the USFWS, is shown as occurring within Bertie County by the North Carolina Natural Heritage Program element occurrence database. No suitable habitat exists for the bald eagle within the project area, with the exception of the Cashie River. Surveys for bald eagles and their nests have been performed at the location of the bridge crossing. No occurrences of this species were noted on the site. Suitable habitat within the project area will be resurveyed prior to construction.

While the shortnose sturgeon is also listed by NCNHP for Bertie County, no surveys have been performed for this species. The construction moratoria for in-water work, which lasts from February 15 to September 30, will limit potential for impacts to this and other anadromous species. Moratoria conservation measures, to be used during construction in non-inundated wetland areas, will include using silt fence to completely contain the construction zone, using a turbidity curtain to separate the construction area from the Cashie River, and implementation of these two measures prior to commencement of the moratorium. The top-down construction method used for the dual bridges will also serve to limit temporary impacts to these waters by eliminating the need for a workbridge or other construction access.

### **CULTURAL RESOURCES**

The proposed project will impact two archaeological sites (Sites 31BR192\*\* and 31BR201/201\*\*) eligible for listing on the National Register of Historic Places. The State Historic Preservation Office (SHPO) concurred with the eligibility of these two sites on July 16, 2002. Preparation of a Memorandum of Agreement for Recovery of Significant Information from Archaeological Sites 31BR192\*\* and 31BR201/201\*\* is in process and will be completed and signed prior to the project construction. Upon completion of the Data Recovery efforts, the NCDOT will prepare and forward a Management Summary to the SHPO detailing the results of the Data Recovery field investigations. The Management Summary will contain sufficient information to demonstrate that the field investigation portion of the Data Recovery Plan has been implemented. Upon acceptance of the recommendations contained in the Management Summary, the SHPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed. Staging and borrow areas outside the original study limits are currently being reviewed for archaeological resources by a qualified subcontractor. The results of these surveys will be submitted to NCDOT and SHPO for review and concurrence prior to construction.

### **STAGING, BORROW, AND WASTE AREA IMPACTS**

As required for projects in the design-build process, staging areas, borrow and waste areas, and haul road impacts have been identified prior to the submission of the permit application. All staging and waste areas will be located entirely in uplands. Eight borrow areas are still under consideration, of which six will likely be used for this project (as shown in the attached site location map and on Exhibit A). These borrow areas will not impact jurisdictional resources under Section 404 of the Clean Water Act. However, the borrow site located south of Greens Cross Road near the center of the project contains two small (0.66 acre total) isolated wetlands.

These wetlands were formed during the timber management of the site due to plowing across the natural drainage pattern and burn-debris piles that caused compaction of the soils. The USACE verified that these wetlands are isolated, and an isolated wetlands addendum is attached for NCDWQ review. This impact is necessary to avoid using an alternate borrow source that would involve construction of a haul road through high quality wetlands. Instead, the proposed borrow site allows for the use of the existing timber haul road with minor widening and much less impact. This justification is further detailed in the Isolated Wetlands Addendum.

Haul road impacts for the borrow site discussed above are included in the impact summary. Exhibit B presents the location of the haul roads and the impacts associated with its improvements. The impacts are limited to 0.02 acres of temporary fill and a pipe extension along 49 linear feet of perennial stream channel. Haul road impacts will be temporary, and the areas will be regraded to original contours and reforested when the project is completed. Stream banks will be returned to existing conditions and revegetated. A reforestation detail is provided within this permit application. The only other haul road impact is at Site 1 through the pond that will be drained for roadway construction. These impacts have been included in the permit impact calculations and are shown on the attached plans. The borrow pit designated as IP#3 and presented in the 4C concurrence meeting is not included in this permit and will not be used. It has been dropped from consideration due to the presence of wetlands within the furrows on the site. This eliminates over one-quarter acre of temporary wetland impacts and two perennial stream crossings associated with the improvement of a haul road from the site.

#### **UTILITY IMPACTS**

Utility impacts have been accounted for within the attached permit impact sheets and the impact summary tables within this document. Several utilities will be relocated due to the construction of R-2404A. These include overhead power lines, sewer force main, water lines, gas lines, telephone, and cable. These relocations occur along the existing US 13/17 alignment (Sites 1, 2, 3, 4), Greens Cross Road (Sites 9, 18, 19), Wakelon Road (Site 14), and the tie in with the existing US 17 north of Windsor. The utility relocation will be coordinated with the roadway construction, and there will be no additional impacts due to these activities. At Sites 1, 2, 3, 4, 9, 18, and 19, the utilities will be relocated within the proposed slope stake limits in the jurisdictional areas. At Site 14, the Wakelon Road interchange utilities will either be located within the slope stake limits or directionally bored under the entire interchange area. At the tie in with existing US 17 at the end of the project, there will be no utility relocation within jurisdictional areas.

#### **FEMA COMPLIANCE**

A detailed study has been performed on the Cashie River. The dual bridges will span the river, floodplain, and associated wetlands. The design of the structures will not cause a rise in flood elevations along the Cashie River. The project has received approval of the "no-rise" certification.

## MITIGATION

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the Waters of the United States. Mitigation of wetland and surface water impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Executive Order 11990 (Protection of Wetlands) and Department of Transportation Order 5660.1A (Preservation of the Nations Wetlands) emphasize protection of the functions and values provided by wetlands. These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

As previously stated, R-2404A has been designed to incorporate all reasonable and practical design features to avoid and minimize impacts to jurisdictional areas. Avoidance measures were taken during the planning and design processes. Minimization measures were implemented during the design phase to include the examination of appropriate and practicable steps to reduce adverse impacts from the project.

### Avoidance

The following measures were taken during the planning and design phase of the project, or will occur during the construction of the project to avoid impacts to jurisdictional areas:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- 1,700-foot dual bridges will be built using top-down construction to avoid filling within the extensive bottomland wetland system along the Cashie River (Site 7).
- The proposed top-down construction method will eliminate the need for a temporary work bridge or other access method through the bottomland wetlands at the Cashie River.
- At the Wakelon Road interchange, the ramp in quadrant B was removed and a loop added to quadrant A to accommodate this traffic movement and avoid any impacts to the wetlands in quadrant B.
- The tie-ins to existing US 17 at the beginning of the project have been designed to avoid impacting the two existing box culverts under US 17 and South Granville Street (-Y1- and -Y1A-).
- The construction of new ditches within or adjacent to wetlands has been avoided by using 4 to 6 feet of fill for the entire project. This fill allows bridging of wetland soils or other poor material and eliminates the need to undercut or create ditches within the wetlands.

- Orange silt fencing will be installed around all jurisdictional areas (wetlands and streams) that will not be impacted by the project. This will aid in preventing inadvertent trespass by construction personnel or equipment.

### Minimization

Minimization includes the examination of appropriate and practicable steps to reduce any adverse impacts. Minimization techniques were implemented as follows:

#### ◆ **General Minimization Measures**

- Although not a requirement of the Merger 01 commitments, the proposed design provides sediment and erosion control measures equal to the requirements of High Quality Waters regulations. This includes design of the sediment and erosion control devices to accommodate a 25-year storm event rather than the standard 10-year storm.
- Special sediment control fence, consisting of 57-stone and chicken wire with filtration fabric, will be used in wetland areas to prevent sediment from the project site from entering undisturbed wetland areas. This fence will be placed at the toe of fill slopes, as noted on the plans, and will be underlain by fabric to aid in the removal of the stone upon project completion (a drawing detail is attached). The fence is not shown on the permit impact sheets, since final placement of the fence will be based on site conditions. However, the fencing will be limited to the toe of slope and completely contained within the first five feet of the mechanized clearing areas, which are already accounted for in the permit.
- Throughout the large pine-plantation wetland areas (Sites 10, 12, 13, 14, 16 and 17) 36" wetland equalizer pipes will be installed approximately every 500 feet. These pipes will help to retain the existing hydrology of the adjacent wetlands. The pipes will also be constructed one foot below grade to allow small animal and amphibian passage through the pipes. Due to the low flow of these pipes, endwalls and riprap have been eliminated, which further reduces impacts.
- At both interchange locations, wetlands and streams internal to the interchange are being retained to the greatest extent practical. This includes the installation of wetland equalizer pipes under the ramps and loops at -Y6-. Although some of these areas were determined to be total takes in the 4B and 4C meetings, the proposed design retains as much of the function as possible at these locations (discussions of site-by-site total takes are in the Wetland and Stream Impacts section beginning on page 5).
- Fill slopes in wetlands will be at a 3:1 ratio at all jurisdictional areas per the ROD requirements.
- No new ditches will be constructed within or adjacent to wetlands. Existing ditches that will be relocated during the construction of R-2404A will be built to the existing depths and along the closest alignment to the current ditches to avoid changing the hydrology of the adjacent wetlands.
- The project has been designed with a 46-foot median width to minimize lateral encroachment in wetlands. In addition, the roadway has been designed to allow for future expansion within the median rather than to the outside of the roadway.

- Where practical (based on topography, pipe size, and flows) pre-formed scour holes are designed at stormwater outlets adjacent to wetlands. This provides sheet flow at these locations and avoids additional impacts to the wetlands along the project.
- The stormwater drainage system has been designed to provide frequent low-flow outlets rather than a few major outlets which could lead to off-site erosion and degradation of downstream habitats. The system outlets into the wetland equalizer pipes where practical to avoid additional outlets.

◆ **Site-Specific Minimization Measures:**

- **Site 1:** The existing culvert endwall will be extended on the downstream side of the road to avoid any impacts in that area. Temporary impacts to wetlands will be avoided by locating the stilling basin for the construction of the culvert extension within the permanent impact area of the roadway fill. Filling of the larger pond eliminates the need for a driveway pipe under the proposed haul road. This avoids additional impacts due to the installation of the pipe below the road in the undisturbed wetlands adjacent to the stream.
- **Site 2:** Wetland fill was avoided and mechanized clearing limits were minimized along the western slope-stake line. Total avoidance of these impacts was not achieved since it would result in additional impacts to the unimpacted wetlands east of the road. The proposed ditch running north along the eastern edge of the corridor was pulled back to avoid impacting the wetland; this flow dissipates into uplands prior to entering the wetland.
- **Site 3:** Wetland fill was avoided other than the small amount required at the pipe extension. Only a minor amount of mechanized clearing will occur within the main body of the wetland system. These impacts are unavoidable due to the requirement to maintain access to the commercial properties on the east side of the road.
- **Site 4:** The following minimization measures were used at this site:
  - The major minimization effort at this site was achieved by lowering the roadway elevation. An alternative of raising the -Y- line grade over the -L- line was evaluated, but this would have increased wetland impacts to the high quality wetland system upgradient of the interchange as well as required an on-site detour.
  - The alignment was shifted slightly approaching Site 4, which helped to avoid and minimize wetland impacts.
  - Ramp B will be shifted out, widened slightly, and used as a temporary two-way detour during construction to avoid additional impacts from on-site detours and to improve traffic control and public safety.
  - Impacts to the perennial stream and high quality wetlands upgradient of the roadway were minimized by tying the ditch in Quadrant B into the intermittent stream channel prior to entering the perennial stream. The ditch is designed to collect the offsite drainage at the proposed toe of slope and discharge it to the stream and wetland system at low velocity. Avoidance of this ditch would likely lead to degradation of the fill slope and erosion within the wetland system and stream channels.
  - Wetlands and stream channels internal to the interchange will be retained and protected to the greatest extent possible.

- Stormwater detention is provided within Quadrant D of the interchange in order to maximize retention while minimizing impacts to wetlands and streams.
- **Site 5:** The use of a retaining wall was evaluated at this location to avoid impacting the bottomland wetlands. This wall would actually have led to increased impacts due to the necessity of undercutting the wetland soils during construction of the wall. The wall would have also required guardrail construction and 3 feet of extra shoulder due to public safety measures. A minor amount of wetland fill is proposed to avoid the costs and additional impacts associated with a wall.
- **Site 7:** The following minimization efforts were achieved at the bridge location:
  - A construction moratorium will be in place from February 15 to September 30 for work in bottomland wetlands inundated by flow from the Cashie River.
  - Conservation measures will be used during the Cashie River bottomland wetlands construction moratorium, including use of silt fence to isolate any construction areas, use of a turbidity curtain between the River and the construction zone, and implementation of these measures prior to the start of the the moratorium period.
  - The number of piles per bent for the bridge was reduced from 8 to 6, with the exception of four bents that require 7 piles for structural integrity. This resulted in a reduction of permanent wetland impacts.
  - Top-down construction method will be used so that temporary impacts from the construction of a work bridge will not be necessary.
  - The top-down construction will also reduce temporal impacts at this site by reducing the amount of time spent on construction within the wetland system.
  - Hand clearing will be performed under the Cashie River bridges and limited to the minimum clearance required for the crane during construction (25 feet on either side).
  - Standard riprap protection of the upland slopes below the bridge will be used, however no excavation or disturbance except for hand clearing will be required on the slopes.
  - The use of driven H-piles for the bridge piers will greatly reduce the amount of actual construction time and disturbance in the wetlands compared to drilled piers.
  - Deck drains are located more than 100' beyond the 30' CAMA buffer around the public trust waters.
  - Deck drains have been spaced at 6 foot intervals and reduced to 4 inch diameter to reduce the concentrated flows during the design storm.
  - Stormwater on the remaining bridge surface (without deck drains) will be routed to two pre-formed scour holes with vegetated filter strips located equidistant from any surface water bodies. This provides the greatest amount of treatment possible prior to entering the surface waters.
- **Site 9:** The existing -Y- line roadway (Greens Cross Road) will be used as the on-site detour in order to minimize wetland impacts.
- **Site 12:** The existing ditch at Sta 295+00 to 297+00 will be replaced with a similar ditch along the toe of the roadway fill. The bottom elevation of the proposed ditch will be the same as the existing one in order to avoid any draining of the adjacent wetlands.
- **Site 13:** The existing roadside ditch between Sites 13 and 14 will be replaced by lateral V-ditches at the same bottom elevation as the existing ditches. This will retain the existing roadside hydrology and prevent draining of the adjacent wetlands.

- **Site 14:** As agreed upon in the 4A meeting, Loop A was added and Ramp B removed in order to minimize impacts to the larger wetland system. Wetlands within quadrant A will be retained, using equalizer pipes to aide in maintenance of hydrologic equilibrium. A temporary detour required at this intersection was located adjacent to permanent impacts in Quadrants A and D in order to minimize the detour's impact area and avoid additional impacts in Quadrant B. The additional mechanized clearing within the loop is required for sight distance and safety of the traveling public.
- **Site 15:** The alignment was shifted as far north as possible in order to minimize impacts to this wetland.
- **Site 17:** An equalizer pipe will be installed at this location in order to retain the hydrology in the upper portion of the wetland. This, along with the off-site drainage from north of the roadway will allow this system to retain its function.

### Compensation

The primary emphasis of compensatory mitigation is to reestablish a condition that would have existed if the project were not built. As previously stated, mitigation is limited to reasonable expenditures and practicable considerations related to highway operation. Mitigation is generally accomplished through a combination of methods designed to replace wetland functions and values lost as a result of construction of the project. These methods consist of creation of new wetlands from uplands, borrow pits, and other non-wetland areas; restoration of wetlands; and enhancement of existing wetlands. Where such options may not be available, or when existing wetlands and wetland-surface water complexes are considered to be important resources worthy of preservation, consideration is given to preservation as at least one component of a compensatory mitigation proposal.

**FHWA Step Down Compliance:** All compensatory mitigation must be in compliance with 23 CFR Part 777.9 (Mitigation of Impacts), which describes the following actions to qualify for Federal-aid highway funding. This process is known as Federal Highway Administration "Step Down" procedures described in the following points:

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pits, interchange areas, and along the roadside.
2. When mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including creation, restoration, enhancement and preservation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the EEP will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects. The offsetting mitigation will be derived from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 68.56 acres of

jurisdictional wetlands (4.05 acres of riparian wetlands and 64.51 acres of non-riparian wetlands), 0.66 of isolated wetlands, and 1,354 feet of jurisdictional important streams will be offset by compensatory mitigation provided by EEP. A copy of the EEP acceptance letter is included with this application.

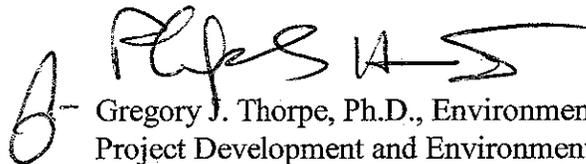
Initial surveys for on-site mitigation opportunities were performed by NCDOT. The results were identified in the Final EIS for the project. Several potential mitigation sites within the proximity to the project were further evaluated, but no feasible on-site mitigation opportunities resulted. Therefore, no on-site mitigation is proposed for R-2404A. Through avoidance and minimization described above, wetland impacts have been reduced from the ROD by 60 acres, and stream impacts requiring mitigation have been reduced by 806 linear feet from the May 2005 revised stream calculations.

### REGULATORY APPROVALS

This application is hereby made for a Clean Water Act Section 404 Individual Permit, Section 401 Water Quality Certification, and Isolated Wetlands Permit for construction of R-2404A. NCDOT is applying for a CAMA Major Development Permit under separate cover. In compliance with Section 143-215.3D(e) of the NCAC and 15A NCAC 07J.0204b(6A) NCDOT will provide \$475.00 to act as payment for processing the CAMA Application and 401 Certification as previously noted in this application.

If you have any questions or need additional information, please call Mr. Chris Rivenbark at (919) 715-1460 or via email at [crivenbark@dot.state.nc.us](mailto:crivenbark@dot.state.nc.us).

Sincerely,



Gregory J. Thorpe, Ph.D., Environmental Management Director  
Project Development and Environmental Analysis Branch

CC without attachments:

Mr. John Hennessy, NCDWQ  
Mr. Travis Wilson, NCWRC  
Ms. Becky Fox, USEPA – Whittier, NC  
Mr. Ronald Mikulak, USEPA – Atlanta, GA  
Mr. Clarence W. Coleman, P.E., FHWA  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Michael Street, NCDMF  
Ms. Lynn Mathis, NCDCM  
Ms. Cathy Brittingham, NCDCM  
Mr. Scott McLendon, USACE – Wilmington, NC  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Ms. Beth Harmon, EEP  
Mr. Todd Jones, NCDOT External Audit Branch  
Ms. Stacy Baldwin, P.E., PDEA  
Mr. Carl Goode, P.E., Human Environment Unit Head  
Mr. Roger Rochelle, P.E., Design Services  
Mr. Mark Staley, Roadside Environmental  
Mr. Don Conner, P.E., Division 1 Engineer  
Mr. Clay Willis, Division 1 Environmental Officer

# APPLICATION

(To be completed by all applicants)

## 1. APPLICANT

a. Landowner:

Name NC Department of Transportation

Address 1548 Mail Service Center

City Raleigh State NC

Zip 27699-1548 Day Phone 919-715-1460

Fax 919-715-1501

b. Authorized Agent:

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Zip \_\_\_\_\_ Day Phone \_\_\_\_\_

Fax \_\_\_\_\_

c. Project name (if any) TIP R-2404A, State Project  
No. C 201236, Windsor Bypass

NOTE: *Permit will be issued in name of landowner(s), and/or project name.*

## 2. LOCATION OF PROPOSED PROJECT

a. County Bertie

b. City, town, community or landmark

Windsor

c. Street address or secondary road number

US 13/17

d. Is proposed work within city limits or planning jurisdiction?  Yes  No

e. Name of body of water nearest project (e.g. river, creek, sound, bay) Cashie River

## 3. DESCRIPTION AND PLANNED USE OF PROPOSED PROJECT

a. List all development activities you propose (e.g. building a home, motel, marina, bulkhead, pier, and excavation and/or filling activities).

Roadway widening, bridge construction, and new roadway alignment construction

b. Is the proposed activity maintenance of an existing project, new work, or both? New work

c. Will the project be for public, private or commercial use? Public

d. Give a brief description of purpose, use, methods of construction and daily operations of proposed project. If more space is needed, please attach additional pages.

Widening of existing US 13/17 from two to four lanes from US 13/17 intersection south of Windsor to King St. New 4-lane controlled access alignment from King St. to US 17 North of Windsor. Project will be constructed using heavy highway construction equipment. See attached narrative for details.

**4. LAND AND WATER CHARACTERISTICS**

- a. Size of entire tract 160 Acres
- b. Size of individual lot(s) N/A
- c. Approximate elevation of tract above MHW or NWL 0 to 50 Feet
- d. Soil type(s) and texture(s) of tract  
Loam surface soils and loamy sand to clayey subsoils
- e. Vegetation on tract Managed timberland, agriculture & hardwood forest as described in the permit application
- f. Man-made features now on tract Roadway - existing US 13 (3 mi) & Greens Cross & Wakelon Rds.
- g. What is the CAMA Land Use Plan land classification of the site? *(Consult the local land use plan.)*  

<input checked="" type="checkbox"/> Conservation	<input type="checkbox"/> Transitional
<input checked="" type="checkbox"/> Developed	<input type="checkbox"/> Community
<input checked="" type="checkbox"/> Rural	<input type="checkbox"/> Other
- h. How is the tract zoned by local government?  
N/A
- i. Is the proposed project consistent with the applicable zoning?  Yes  No  
*(Attach zoning compliance certificate, if applicable)*
- j. Has a professional archaeological assessment been done for the tract?  Yes  No  
If yes, by whom? ESI, Inc.
- k. Is the project located in a National Registered Historic District or does it involve a National Register listed or eligible property?  
 Yes  No
- l. Are there wetlands on the site?  Yes  No  
Coastal (marsh)  Other   
If yes, has a delineation been conducted? Yes  
*(Attach documentation, if available)*

m. Describe existing wastewater treatment facilities.  
None

n. Describe location and type of discharges to waters of the state. (For example, surface runoff, sanitary wastewater, industrial/commercial effluent, "wash down" and residential discharges.)  
Surface run-off from roadway

o. Describe existing drinking water supply source.  
None

**5. ADDITIONAL INFORMATION**

In addition to the completed application form, the following items must be submitted:

- A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties. If the applicant is not claiming to be the owner of said property, then forward a copy of the deed or other instrument under which the owner claims title, plus written permission from the owner to carry out the project.
- An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale in black ink on an 8 1/2" by 11" white paper. (Refer to Coastal Resources Commission Rule 7J.0203 for a detailed description.)

Please note that original drawings are preferred and only high quality copies will be accepted. Blue-line prints or other larger plats are acceptable only if an adequate number of quality copies are provided by applicant. (Contact the U.S. Army Corps of Engineers regarding that agency's use of larger drawings.) A site or location map is a part of plat requirements and it must be sufficiently detailed to guide agency personnel unfamiliar with the area to the

site. Include highway or secondary road (SR) numbers, landmarks, and the like.

- A Stormwater Certification, if one is necessary.
- A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management. Upon signing this form, the applicant further certifies that such notice has been provided.

Name See attached Property Owners List  
 Address \_\_\_\_\_  
 Phone \_\_\_\_\_

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Phone \_\_\_\_\_

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Phone \_\_\_\_\_

- A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

None \_\_\_\_\_

- A check for \$250 made payable to the Department of Environment, Health, and Natural Resources (DEHNR) to cover the costs of processing the application.
- A signed AEC hazard notice for projects in oceanfront and inlet areas.
- A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A - 1 to 10) If the project involves the expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

## 6. CERTIFICATION AND PERMISSION TO ENTER ON LAND

I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to conditions and restrictions contained in the permit.

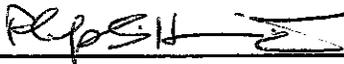
I certify that to the best of my knowledge, the proposed activity complies with the State of North Carolina's approved Coastal Management Program and will be conducted in a manner consistent with such program.

I certify that I am authorized to grant, and do in fact, grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

This is the 13 day of September, 192005.

Print Name Philip S. Harris III

Signature   
Landowner or Authorized Agent

Please indicate attachments pertaining to your proposed project.

- DCM MP-2 Excavation and Fill Information
- DCM MP-3 Upland Development
- DCM MP-4 Structures Information
- DCM MP-5 Bridges and Culverts
- DCM MP-6 Marina Development

**NOTE:** Please sign and date each attachment in the space provided at the bottom of each form.

# BRIDGES AND CULVERTS

Attach this form to Joint Application for CAMA Major Permit, Form DCM-MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project.

## 1. BRIDGES

- a. Public  Private \_\_\_\_\_
- b. Type of bridge (construction material)  
Concrete cored slab with steel piles \_\_\_\_\_
- c. Water body to be crossed by bridge  
Cashie River \_\_\_\_\_
- d. Water depth at the proposed crossing at MLW or NWL 10 feet
- e. Will proposed bridge replace an existing bridge?  
 Yes  No  
If yes,
  - (1) Length of existing bridge \_\_\_\_\_
  - (2) Width of existing bridge \_\_\_\_\_
  - (3) Navigation clearance underneath existing bridge \_\_\_\_\_
  - (4) Will all, or a part of, the existing bridge be removed? (Explain) \_\_\_\_\_
- f. Will proposed bridge replace an existing culvert(s)?  
 Yes  No  
If yes,
  - (1) Length of existing culvert \_\_\_\_\_
  - (2) Width of existing culvert \_\_\_\_\_
  - (3) Height of the top of the existing culvert above the MHW or NWL \_\_\_\_\_

(4) Will all, or a part of, the existing culvert be removed? (Explain) \_\_\_\_\_

- g. Length of proposed bridge 1700 feet
- h. Width of proposed bridge 88 (dual structures)
- i. Height of proposed bridge above wetlands  
20 - 35 feet
- j. Will the proposed bridge affect existing water flow?  
 Yes  No  
If yes, explain \_\_\_\_\_
- k. Navigation clearance underneath proposed bridge  
approx. 20 feet
- l. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening?  Yes  No  
If yes, explain \_\_\_\_\_
- m. Will the proposed bridge cross wetlands containing no navigable waters?  Yes  No  
If yes, explain The bridge will span the Cashie River and the bottom-land wetland system.
- n. Have you contacted the U.S. Coast Guard concerning their approval?  
 Yes  No  
If yes, please provide record of their action.

**2. CULVERTS**

- a. Water body in which culvert is to be placed  
UT to Cashie River
- b. Number of culverts proposed 1 extension
- c. Type of culvert (construction material, style)  
8 ft x 6 ft reinforced concrete box culvert
- d. Will proposed culvert replace an existing bridge?  
Yes  No  
If yes,  
 (1) Length of existing bridge \_\_\_\_\_  
 (2) Width of existing bridge \_\_\_\_\_  
 (3) Navigation clearance underneath existing bridge \_\_\_\_\_  
 (4) Will all, or a part of, the existing bridge be removed? (Explain) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- e. Will proposed culvert replace an existing culvert?  
 Yes No  
If yes, See attached permit drawings  
 (1) Length of existing culvert 58 feet  
 (2) Width of existing culvert 8 feet  
 (3) Height of the top of the existing culvert above the MHW or NWL 5 feet  
 (4) Will all, or a part of, the existing culvert be removed? (Explain) The existing headwall will be removed to add a 72 ft extension for road widening
- f. Length of proposed culvert 130 ft
- g. Width of proposed culvert 8 ft
- h. Height of the top of the proposed culvert above the MHW or NWL 5 ft
- i. Will the proposed culvert affect existing water flow?  
Yes  No  
If yes, explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- j. Will the proposed culvert affect existing navigation potential? Yes  No  
If yes, explain \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**3. EXCAVATION AND FILL**

- a. Will the placement of the proposed bridge or culvert require any excavation below the MHW or NWL?  
 Yes No  
If yes, See attached permit drawings  
 (1) Length of area to be excavated 85 feet  
 (2) Width of area to be excavated 10 feet  
 (3) Depth of area to be excavated 2 feet  
 (4) Amount of material to be excavated in cubic yards 63 cy
- b. Will the placement of the proposed bridge or culvert require any excavation within:  
Coastal Wetlands SAVs Other Wetlands  
If yes,  
 (1) Length of area to be excavated \_\_\_\_\_  
 (2) Width of area to be excavated \_\_\_\_\_  
 (3) Amount of material to be excavated in cubic yards \_\_\_\_\_
- c. Will the placement of the proposed bridge or culvert require any highground excavation?  
Yes  No  
If yes,  
 (1) Length of area to be excavated \_\_\_\_\_  
 (2) Width of area to be excavated \_\_\_\_\_  
 (3) Amount of material to be excavated in cubic yards \_\_\_\_\_
- d. If the placement of the bridge or culvert involves any excavation, please complete the following:  
 (1) Location of the spoil disposal area  
Upland disposal area  
 (2) Dimensions of spoil disposal area  
To be determined  
 (3) Do you claim title to the disposal area?  
 Yes No  
If no, attach a letter granting permission from the owner.

(4) Will the disposal area be available for future maintenance?  Yes  No

(5) Does the disposal area include any coastal wetlands (marsh), SAVs, or other wetlands?  Yes  No

If yes, give dimensions if different from (2) above. \_\_\_\_\_

(6) Does the disposal area include any area below the MHW or NWL?  Yes  No

If yes, give dimension if different from No. 2 above. \_\_\_\_\_

e. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed below MHW or NWL?  Yes  No

If yes, See attached permit drawings

- (1) Length of area to be filled 85 feet
- (2) Width of area to be filled 25 feet
- (3) Purpose of fill Roadway fill over culvert

f. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed within:

Coastal Wetlands  SAVs  Other Wetlands

If yes, See attached permit drawings

- (1) Length of area to be filled 50 feet
- (2) Width of area to be filled 300 feet
- (3) Purpose of fill Roadway fill approaching culvert

g. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed on highground?  Yes  No

If yes,

- (1) Length of area to be filled \_\_\_\_\_
- (2) Width of area to be filled \_\_\_\_\_
- (3) Purpose of fill \_\_\_\_\_

b. Will the proposed project require the relocation of any existing utility lines?  Yes  No

If yes, explain in detail Several utilities will be relocated within the roadway slope stake limits as described in the permit narrative.

c. Will the proposed project require the construction of any temporary detour structures?  Yes  No

If yes, explain in detail Detours at Greens Cross and Wakelon Rds. (Y5 and Y6) will be required as shown in the attached plans.

d. Will the proposed project require any work channels?  Yes  No

If yes, complete Form DCM-MP-2

e. How will excavated or fill material be kept on site and erosion controlled? Silt fences, diversion ditches, and NCDOT Type B Basins

f. What type of construction equipment will be used (for example, dragline, backhoe or -hydraulic dredge)? Heavy highway construction equipment: crane, backhoe, excavator, bull dozer, pan, gradeall

g. Will wetlands be crossed in transporting equipment to project site?  Yes  No

If yes, explain steps that will be taken to lessen environmental impacts. \_\_\_\_\_

h. Will the placement of the proposed bridge or culvert require any shoreline stabilization?  Yes  No

If yes, explain in detail \_\_\_\_\_

#### 4. GENERAL

a. Will the proposed project involve any mitigation?  Yes  No

If yes, explain in detail Mitigation to be provided by EEP as described in the attached permit narrative.

NCDOT

Applicant or Project Name

Paul Sill

Signature

9/13/05

Date

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

MR HARRY L. THOMPSON  
301 SOUTH KING ST  
WINDSOR NC 27983

2. Article Number  
(Transfer from service label)

7004 1350 0003 4152 6195

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X *Stephanie Thompson*  Agent  
 Addressee

B. Received by (Printed Name)

*Stephanie Thompson* C. Date of Delivery  
9/8/05

D. Is delivery address different from item 1?  Yes  
If YES, enter delivery address below:  No

3. Service Type

Certified Mail  Express Mail  
 Registered  Return Receipt for Merchandise  
 Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

PHELPS & WHITE CONSTRUCTION  
PO BOX 64  
WINDSOR, NC 27983

2. Article Number  
(Transfer from service label)

7004 1350 0003 4152 6218

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X *Tim Phelps*  Agent  
 Addressee

B. Received by (Printed Name)

TIM PHELPS C. Date of Delivery  
9-8-05

D. Is delivery address different from item 1?  Yes  
If YES, enter delivery address below:  No

3. Service Type

Certified Mail  Express Mail  
 Registered  Return Receipt for Merchandise  
 Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

MR STANLEY L THOMPSON  
639 GREEN CROSS RD  
WINDSOR NC 27983

2. Article Number  
(Transfer from service label)

7004 1350 0003 4152 6201

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X *Stanley L Thompson*  Agent  
 Addressee

B. Received by (Printed Name)

*Stanley L Thompson* C. Date of Delivery  
9-8

D. Is delivery address different from item 1?  Yes  
If YES, enter delivery address below:  No

3. Service Type

Certified Mail  Express Mail  
 Registered  Return Receipt for Merchandise  
 Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT  
(33 CFR 325)**

**OMB APPROVAL NO. 0710-003  
Expires December 31, 2004**

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please **DO NOT RETURN** your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

**PRIVACY ACT STATEMENT**

Authority: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

**(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)**

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
--------------------	----------------------	------------------	-------------------------------

**(ITEMS BELOW TO BE FILLED BY APPLICANT)**

5. APPLICANT'S NAME North Carolina Department of Transportation Project Development & Environmental Analysis	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 1548 Mail Service Center Raleigh, NC 27699-1548	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOs. W/AREA CODE a. Residence b. Business 919-733-3141	10. AGENT'S PHONE NOs. W/AREA CODE a. Residence b. Business

**11. STATEMENT OF AUTHORIZATION**

I hereby authorize, \_\_\_\_\_ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE

DATE

**NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY**

12. PROJECT NAME OR TITLE (see instructions) TIP R-2404A, State Project No. C 201236, Windsor Bypass	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Cashie River & unnamed tributaries	14. PROJECT STREET ADDRESS (if applicable)
15. LOCATION OF PROJECT  Bertie COUNTY NC STATE	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.

17. DIRECTIONS TO THE SITE  
*Please see attached vicinity map and cover letter.*

18. Nature of Activity (Description of project, include all features)

Widening of existing US 13/17 from two to four lanes from US 13/17 intersection south of Windsor to King Street. New 4-lane controlled access alignment from King Street to US 17 near SR 1503 (Davis Road), northeast of Windsor. The project includes two interchanges (US13/King Street and Wakelon Road) and a 1700 foot bridge over the Cashie River and adjacent wetlands. Please see the attached cover letter and permit impact sheets for a full description of the proposed activity.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the project is to improve mobility through Bertie County on US 17 without delays caused by local traffic. The project is scheduled to begin construction in January 2006 and to be completed by June 2008.

**USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED**

20. Reason(s) for Discharge

Fill material for roadway widening and new roadway alignment construction. Along the new alignment section 4-6 feet of fill is required to bridge wetland soils and avoid undercutting and draining. Site-specific descriptions of impacts are included in the attached cover letter.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Please see attached drawings.

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Please see cover letter and attached drawings.

23. Is Any Portion of the Work Already Complete? Yes \_\_\_ No X IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

Please see sheets 4, 5 and 6 in the permit drawing package.

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

\* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

  
SIGNATURE OF APPLICANT

9/13/05  
DATE

\_\_\_\_\_  
SIGNATURE OF AGENT

\_\_\_\_\_  
DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**ISOLATED WETLANDS ADDENDUM**  
**TIP No. R-2404A**  
**WBS 34424.3.7**  
**Windsor Bypass**

**The purpose of this Isolated Wetlands Addendum is to provide the North Carolina Division of Water Quality (NCDWQ) with the necessary information to evaluate the impacts of the project on isolated wetlands. Material is presented in this addendum to illustrate that the project has been designed to comply with the Isolated Wetlands/Waters Rules (15A NCAC 2H, Section .1300). The impact areas described below were determined to be isolated features by Ms. Tracy Wheeler of the US Army Corps of Engineers (USACE) Washington Field Office on May 25, 2005, and therefore not under the jurisdiction of Section 404 of the Clean Water Act. We request that NCDWQ issue an Authorization Certificate for this permit, pursuant to 15A NCAC 2H .1305 for the proposed use.**

The North Carolina Department of Transportation (NCDOT) proposes to improve existing U.S. Highway 17 (US 17) to a high speed, multi-lane highway that bypasses the Town of Windsor (R-2404A). The purpose of the project is to improve mobility through Bertie County on US 17 without delays caused by local traffic. The project will include 2.3 miles of existing road widening from 2 to 4 lanes and 7.3 miles of new alignment 5-lane divided highway, including dual 1,700-foot bridges crossing the Cashie River. The design-build project is scheduled to begin construction in January 2006 and to be completed by June 2008.

**Isolated Wetlands Impacts:** Due to the nature of this project, impacts to two isolated wetlands are unavoidable. The proposed impacts are total takes of a 0.21-acre wetland and a 0.45-acre wetland in a proposed borrow site designated as "IP#1". These two wetland areas are currently evolving from emergent habitat to scrub-shrub habitat. They are dominated by rushes and sedges, with small shrubs and trees including red maple and groundsel tree. The wetlands will be impacted by excavation for a proposed borrow site. These wetlands occur within a loblolly pine plantation currently owned and managed by International Paper. This tract was clearcut in the past five years and re-planted in rows of loblolly pine. The new rows were plowed in a north-south orientation perpendicular to the natural drainage pattern, whereas the previous rows had been in an east-west orientation. This change in drainage patterns appears to have altered the surface hydrology of the site. In addition, the two low-lying areas where the wetlands occur may have been where burn piles were located after the clearcut. The burning of debris and the use of heavy machinery to pile the debris produce depressions in the soil, which causes additional changes in hydrology. A topsoil layer has also been removed through the timber management activities, leaving only a clay layer in place. Due to the heavy amount of clay in the current surface soils, a perched water table is created that has no means of drainage.

**Avoidance & Minimization:** The prime contractor on this project has spent 2 to 3 years searching for appropriate borrow sites for this project. They have looked at more than

7,500 acres of land in order to find approximately 2 million cubic yards of borrow material. The results of this extensive search are displayed in Exhibit A. The vast majority of the 7,500 acres were dismissed due to unsuitable soil characteristics (too much clay content, too much overburden, too little sand content, etc.) or other issues (high costs, large wetland impacts, stream impacts, lack of landowner agreement, etc.).

The borrow requirements for this project must be viewed as two separate projects. The Cashie River bridges serve as a constraint, dividing the east and west portions of the project. The bridges will not be complete until most of the project is built, and the other local Cashie River crossings are on low-tonnage bridges. This prevents the contractor from hauling borrow from one side of the project to the other. The western portion of the project has sufficient borrow from 3 sites (Sessoms, Powell, and Phelps-White), with no associated impacts to wetlands or streams. The eastern portion of the project does not have sufficient borrow available to build the roadway without the use of the IP#1 site.

As described above and presented in Exhibit A, exhaustive searches for borrow have been performed on the eastern portion of the project. Due to the extensive amount of wetlands within the managed timberland adjacent to the project, few potential sites are available for borrow purposes. Furthermore, the required buffers to prevent proposed borrow areas from draining wetlands has reduced the available amount of borrow for the project. Of the five remaining borrow sites west of the Cashie River, only three are of sufficient size to provide the required material for the project. The easternmost site (Harden) could provide borrow for the end of the project pending negotiations with property owners, but one of the two large borrow sites south of the alignment is required to construct the project.

These two borrow areas, Casteloe and IP#1, both provide sufficient borrow to meet the needs of the project. In evaluating these potential areas, the total amount of impacts to Section 404 and isolated wetlands and streams were considered. The Casteloe borrow pit would not require any impacts to these resources from the borrow activities, but would require a new haul road from the pit north to the alignment. This access road would have to cross a significant natural drainage and therefore require additional impacts to a high quality wetland and stream system that drains directly into the Cashie River. The use of the existing logging road to the east of the Casteloe pit would not be available since it is owned by International Paper. In addition to the haul road, the Casteloe Pit is bordered on the west side by the extensive bottomland hardwood swamp of the Cashie River floodplain.

In comparison, the IP#1 site would require the aforementioned 0.66 acres of impact to the two isolated features, and an additional 0.02 acres and 49 linear feet of temporary impacts to upgrade an existing logging-road crossing of a perennial stream and associated wetland. However, the remaining 0.9-mile of haul road improvements would not impact any additional wetlands or streams. This road would not be available for use if the Casteloe pit was used, since it is on International Paper property. The haul road would be available for use in association with the use of the IP#1 pit. This site is bordered by managed timberland with a smaller bottomland system bordering the western and

southern portions of the property. The isolated wetland impacts are unavoidable due to their location in the central portion of the site. Avoidance of these two areas, in combination with the required drainage buffers, would reduce the borrow volume to a point that it would not be a feasible option for construction and would not meet the fill requirements of the project.

**Alternative Evaluation Summary:** The following borrow alternatives were evaluated to meet the needs for constructing the central portion of the project:

1. Use of the Casteloe Pit for the required borrow in the central portion of the project. This would result in significant additional impacts to the drainage described above. These impacts would be greater than those associated with IP#1. Due to the additional impacts associated with this borrow pit, this alternative was deemed impractical.
2. Use of the IP#1 Pit. This would result in the impacts to isolated wetlands discussed in this addendum. These minimal impacts are not connected to other jurisdictional resources and therefore would not increase the potential to degrade downstream water resources. Due to the minimal amount of impact associated with this borrow area, this was determined to be the most practical alternative.
3. Use of another borrow source. This would require identification of an additional borrow area, which is unlikely considering the two to three years of field effort and landowner contacts already pursued. Other, more remote locations may be available for borrow, but these would likely require additional impacts associated with other jurisdictional resources or extremely high costs for hauling the material to the job site. Therefore, this alternative is deemed impractical.
4. Reducing the amount of fill required for the project by lowering the grade of the roadway. The approved line and grade of the roadway includes from 4 to 5 feet of fill across the eastern portion of the project. This fill will provide cover over the equalizer pipes, which maintain hydrology across the road alignment. This fill will also allow bridging of the existing wetland soils and has been minimized to the greatest practical extent. Lowering this grade would not allow the contractor to bridge the wetland soils (which are generally unsuitable for construction purposes), and therefore require excavation of this material prior to placement of the fill material. The result of this approach would be equal or additional borrow requirements to replace the excavated material and potential additional impacts associated with the excavation and draining of wetlands along the alignment. Since no additional borrow sites have been identified after extensive searches, and additional impacts and costs would be associated with remote borrow locations, this was determined to be impractical for the project.

**Sediment & Erosion Control Design:** As is noted in the permit narrative, this project will be constructed using the High Quality Waters criteria for design of sediment and erosion control. The use of these extensive measures, and the required buffers from the Section 404 wetlands adjacent to the site, serve to prevent degradation of water quality in downstream resources. Discharge from the borrow pit will be controlled on site and meet current state requirements for turbidity. These measures will be detailed in a reclamation

plan to be submitted for USACE and NCDWQ review prior to construction. The reclamation plan will include full details of the proposed sediment and erosion control measures, dewatering devices (if required), Best Management Practices (BMPs) for control of any discharge, and modeling of potential drainage effects on adjacent wetlands and streams. The erosion control measures and BMPs will be monitored as part of the compliance plan for the site throughout construction and will be removed upon completion of the project.

**Mitigation:** The 0.66 acres of isolated wetland impacts fall below the 1.0 acre requirement for mitigation under the current regulations. However, due to the amount of Section 404 wetland impacts associated with the construction of this project, these impacts have been included in the attached permit narrative mitigation section. If required, NCDOT will provide mitigation for the isolated wetlands through the North Carolina Ecosystem Enhancement Program (EEP).

**Summary:** In conclusion, the isolated wetland impacts meet the standards and requirements under 15A NCAC 2H, Section .1300 as follows:

1. There is no reasonable practical alternative to provide the necessary borrow for the central portion of the project.
2. The impacts have been minimized to the greatest practical extent, including impacts to non-isolated wetlands as described above.
3. No groundwater or surface water quality violations will result from the proposed activity.
4. All impacts associated with, or in proximity to, the project are included in this application and there will be no cumulative impacts associated with the project. A full evaluation of indirect and cumulative impacts has been performed for R-2404A and is available from NCDOT.
5. If required, mitigation will be provided through EEP for the 0.66 acres of isolated wetlands, although the impacts fall below the 1.0 acre threshold in the isolated wetland rules.

**STORMWATER MANAGEMENT PLAN**  
**WINDSOR BYPASS**  
**R-2404A**

**1.0 PURPOSE**

The purpose of this Stormwater Management Plan (SMP) is to document the design process used to develop the stormwater management for the Windsor Bypass (R-2404A) for the North Carolina Department of Transportation (NCDOT). This SMP describes the stormwater management and control features included in the hydraulic design for the Project. This Plan and the associated design have been prepared in general accordance with NCDOT Standards and the North Carolina Department of Environment and Natural Resources (NCDENR) Stormwater Best Management Practices manual.

**2.0 CONTACT INFORMATION**

Contractor: The Contractor of the site and the person to contact for construction issues is:

Barnhill Contracting Company  
Attn.: Allen Barnhill, P.E.  
P.O. Box 1529  
Tarboro, NC 27886  
Telephone: (252) 823-1021  
FAX: (252) 823-0137

Engineer: For questions regarding this Plan, please contact the following:

HDR Engineering, Inc. of the Carolinas  
Attn.: Jonathan Henderson, P.E.  
3733 National Drive, Suite 207  
Raleigh, NC 27612  
Telephone: (919) 785-1118  
FAX: (919) 785-1187

### **3.0 PROJECT DESCRIPTION**

The project consists of constructing the Windsor Bypass (R-2404A) from the US 13/17 intersection southwest of Windsor, North Carolina to the beginning of the 5-lane section of US 17 northeast of Windsor. Project work includes grading, paving, structures, ramps, loop, drainage components, and shoulder construction. The project includes 2.3 miles of existing road widening and 7.3 miles of new alignment, including a 1700 foot bridge over the Cashie River and its adjacent wetlands and interchanges with US 13 and Wakelon Road.

### **4.0 SITE BACKGROUND INFORMATION**

The Windsor Bypass is located in the Inner Coastal Plain Physiographic Region within the Roanoke River Basin. The topography is relatively flat throughout most of the project area. From the beginning of the project through the Cashie River bridges the topography is generally shallow slopes and ridges grading down to streams and the flood plain of the Cashie River. From the Cashie River to the end of the project, the terrain becomes primarily flat pine plantations.

The major environmental feature on the project is the Cashie River and its adjacent flood plain and extensive bottomland wetland system. This large wetland spans almost the entire flood plain of the river. In addition to this crossing, a culvert will be extended along an unnamed tributary of the Cashie River near the beginning of the project. One other feature, a small perennial stream, will be piped through the US 13 interchange.

The Windsor Bypass will be constructed through residential and commercial areas, managed pine plantations and wetlands, and the environmentally sensitive areas described above. All streams within the Project area are classified as Class C by NCDENR. The Cashie River is listed on the 2004 draft 303(d) list due to mercury contamination in fish. Bertie County is also one of the twenty coastal counties under jurisdiction of CAMA. Therefore, a State Stormwater permit is required for this project.

The following commitments related to stormwater management have been made based on the Record of Decision for the Environmental Impact Statement for this project and the requirements of the scope of work:

- The Cashie River and the adjacent bottomland wetlands will be bridged entirely.
- Roadway grades will be set in order to avoid using roadway drainage ditches in designated wetlands.

These commitments are in addition to the standard commitments for Coastal Area Management Act and Clean Water Act Section 404 permits and 401 certification conditions.

## **5.0 BMP Evaluation Criteria**

Best management practices (BMPs) were evaluated at all outfall locations in order to limit any impacts from the increase in stormwater from the project. NCDRCM and NCDENR regulations for stormwater management were followed during design. During the evaluation, the following conditions were considered:

- The proximity of the location to surface waters and wetlands.
- The slope and consistency of the topography between the outfall and the environmentally sensitive area.
- The pre- and post-project stormwater flow at the outfall location.
- The proximity of the BMP to the roadway and any potential safety hazards involved.
- Access and maintenance issues critical to the continued operation and success of the BMP.
- Existence of natural, non-jurisdictional channels or structures for use in routing stormwater flows.

## 6.0 BMP EVALUATION

The following steps were followed to determine the applicability of using BMPs at each location:

- All ditches and medians were designed to comply with NCDENR grass swale design criteria if possible.
- Determine if there is a significant change in pre- and post-project stormwater flows.
- BMPs were evaluated in the following sequence:
  - Infiltration
  - Wet detention
  - Dry detention
  - Level spreader with vegetative buffer
- For low flow outlets and small pipes (15” or 18”), the use of a pre-formed scour hole was evaluated based on topography and flows.

Based on this evaluation, BMPs were chosen for each environmentally sensitive location, as well as across the entire Project as described in Section 7.

## 7.0 Pre- and Post-construction Stormwater Analysis

The pre- and post-construction runoff rates were analyzed for major outfall locations where the outlet channel receives the runoff in close proximity to the project. The US 13/17 interchange was analyzed because it met these criteria and the additional impervious surfaces created by the interchange warranted additional analysis. Initial analysis revealed a slight increase in post construction runoff. As a result of this increase, and in an effort to reduce environmental impacts, a dry detention basin was added inside loop A at the US 13/17 interchange. The addition of this dry detention basin, as well as maintaining

wetlands internal to the interchange, actually resulted in a decrease in the post construction runoff by approximately seven percent. The Wakelon Road interchange, which is located in an area dominated by wetlands, was not analyzed since there is no common receiving channel and stormwater will flow into these existing wetlands, which provide natural storage and infiltration.

The existing character of the basins throughout the project are primarily wetlands. These wetland areas have been maintained to the maximum extent practical, such as retaining them internal to the interchanges. This provides both pre- and post-construction storage for runoff. The project area consists of large drainage basins and the addition of two or four lanes of impervious pavement does not significantly impact post-construction discharges or velocities.

## **8.0 DESIGN DETAILS**

The following sections describe the BMPs used at each environmentally sensitive area along the Project. The entire stormwater drainage system was designed to outlet frequently at relatively low velocities in order to avoid indirect impacts on the aquatic environment. BMPs were evaluated at each outfall location based on the criteria described in Section 6.0.

### **8.1 General BMP Design**

Throughout the Project, median and roadside ditches have been designed to meet the grass-swale design criteria described in the NCDENR Stormwater Manual. Only two ditches do not meet these criteria due to site constraints such as topography or right-of-way not allowing for the minimum 3:1 side-slopes. Off-site stormwater is passed through the Project without treatment.

On-site stormwater was treated by grass swale, dry detention, and pre-formed scour holes. In general, preformed scour holes were used in areas of flat topography and adjacent to wetlands where the flows were

relatively low. The following sections address specific areas where BMP design differed from the general approach.

## **8.2 Site 1 - Culvert Extension @ Sta 44+55 -L-**

This is the location of the culvert extension on the unnamed tributary of the Cashie River. In addition, two ponds adjacent and within the roadway widening will be drained for the construction of the project. These ponds will not be filled, and therefore will provide some detention of off-site stormwater prior to it entering this UT. No on-site stormwater will be routed through this area. Rather, it will outlet into a preformed scour hole on the downstream side of the road in order to obtain sheet flow prior to entering the adjacent wetland.

## **8.3 Site 4 - Interchange with US 13**

This location has the greatest amount of impervious surface on the project due to the ramps and loops associated with the routing of traffic from US 13 and US 17. A slight increase in post-construction runoff compared to pre-construction was calculated for this site. Therefore, the area within Loop D was evaluated for BMP implementation. Due to the relatively low water table compared to the rest of the site, along with the clay loam soils in the area, it was determined that the area could be used as a dry detention basin. The stormwater from most of the interchange and the entire bridge is routed to the detention basin and then discharged to the stream channel at low velocity. Maintenance access is provided from King Street (-Y4-) located adjacent to the basin. Infiltration and wet detention were evaluated for this site, however the soil conditions and adjacent roadway would not allow for these BMPs. Wet detention internal to the interchange increases hazards to the traveling public.

## **8.4 Site 6 - Cashie River Bridges**

The dual structures over the Cashie River and adjacent wetlands are 1700 feet long. Deck drains are required for this length of bridge in order to

prevent water from spreading into the lanes during the design storm event. The deck drains have been designed to discharge into the forested wetlands at least 100 feet from the 30-foot CAMA buffer on the Cashie River. This will allow adequate treatment of the deck drain discharge prior to entering a surface water feature. Four inch diameter deck drains have been spaced at 6-foot intervals which to reduce discharge during a storm event. The remainder of the bridge stormwater will be collected on the southwest end and discharged into preformed scour holes located on either side of the approach to the bridge. The scour holes will discharge into a vegetated filter strip equidistant from the adjacent waters.

## 8.5 Managed Pine Farm Wetlands

Throughout the extensive managed pine wetlands, on-site stormwater has been routed through wetland equalizer pipes that are designed to retain the hydrology of the existing wetlands. These pipes will be 36 inches in diameter and embedded 1 foot into the existing ground. Stormwater entering these pipes will flow in both directions and outlet on both sides of the road at extremely low velocities. The onsite stormwater will have already been treated through grass swales in the roadway median.

## 9.0 CONCLUSION

The proposed stormwater management system is designed to be an integrated approach of appropriate BMPs that effectively control and treat on-site stormwater for this facility. This plan is consistent with both Federal and State regulations and NCDOT guidance. More details regarding the individual stormwater structures and BMPs are provided in the attached computations, including dry detention basins design.

**TO: FILE**  
**FROM: Jonathan Henderson**  
**DATE: June 10, 2005**  
**SUBJECT: R-2404A Design-Build, 4B Meeting**

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**Project Name: R-2404A**

On May 19, 2005, following the steps of the “Merger 01” process, the 4B concurrence meeting was held in the Highway Building boardroom. In attendance at the meeting were:

Christina Breen	NCDWQ
Nikki Thomson	NCDWQ
Gary Jordan	USFWS – Raleigh
Travis Wilson	NCWRC
Cathy Brittingham	NCDCM
Chris Militscher	USEPA – Raleigh
Bill Biddlecome	USACE – Washington NC
Steve DeWitt	NCDOT Construction
Teresa Bruton	NCDOT Design Build
Khaled Al-Akhdar	NCDOT Design Build
Shannon Lasater	NCDOT Design Build
Rodger Rochelle	NCDOT Project Services
Stacy Baldwin	NCDOT PDEA
Roy Shelton	NCDOT PDEA
James Speer	NCDOT Roadway Design
Paul Ervin	NCDOT Structures Design
Marshall Clawson	NCDOT – Hydraulics Unit
Anne Gamber	NCDOT – Hydraulics Unit
Scott Emory	NCDOT Div. 1 Construction
Bob Capehart	NCDOT Div. 1
Clay Willis	NCDOT Div. 1
Chris Rivenbark	NCDOT ONE
Randall Gattis	Sanford Contractors, Inc.
Allen Barnhill	Barnhill Contracting Co.
Jimmy Spivey	Barnhill Contracting Co.
Jeff Guill	Barnhill Contracting Co.
Greg Kempf	HDR
Jonathan Henderson	HDR
Phil May	HDR
James Rice	HDR
John Jamison	HDR

Rodger Rochelle began the meeting by starting introductions and reviewing a brief history of the project and its prior concurrence points. He noted that all commitments from the 4A concurrence meeting have been carried through to the current design by the design-build team. Jonathan Henderson then began a detailed discussion of the plans as described by sheet below. Comments not related to a specific station or site, or applying to all sites, are included as general comments below. Italics refer to the response given or action needed to resolve the comment. Underlines refer to comments received from the distribution of the draft minutes. The results of the June 15, 2005 DWQ-Stormwater field review of the project are also included and underlined.

### General Comments:

- Nikki Thomson asked that all sites where minor impacts were occurring be evaluated to see if the design could be changed to avoid those impacts. *The current plan set is a worst case and HDR is currently working to minimize impacts at these sites. The unavoidable impacts will be presented at the 4C meeting.*
- Cathy Brittingham stated that permit review would take at least 80 to 100 days, and that they have up to 150 days for review if needed. A DCM pre-application field visit should be conducted prior to 4C so that any issues generated by that review can be discussed in the 4C meeting. *Noted – NCDOT ONE will be contacting DCM to set up a field visit.*
- Cathy Brittingham asked if utility impacts have been determined at this point. *The Design-Build process for this project includes utility relocation and ROW acquisition. The utilities will be located within the proposed ROW. Actual impacts will be determined prior to 4C and presented in the 4C package. Utility impacts will be included in the permit.*
- Cathy Brittingham asked if the mitigation request in the letter to EEP will be enough to cover the wetland impacts for the project. *Chris Rivenbark stated that the mitigation request for 130 acres has already been accepted and the acreage was based on the highest probable amount of impacts within the ROW. Phil May stated that the impacts will be below the requested mitigation and these impacts will be presented in the 4C meeting.*

### Sheet 5:

- Two service roads are required to provide adequate and safe access to the adjacent homes and businesses, while avoiding multiple driveway access along the main line. There will be no impacts associated with these roads, since -SR2- will end prior to the wetland at Site 1.

### Sheet 6:

- DWQ asked that the impacts from the pre-formed scour hole be kept out of the wetlands if possible, including temporary impacts. *HDR will evaluate this during the remaining design phase and attempt to eliminate impacts.*

- It was noted that the proposed cul-de-sac has been shifted to Parcel 14 and that access will be provided to Parcel 16 via the mainline.

**Sheet 7:** Site 1.

- Jonathan mentioned that due to existing culvert conditions, the culvert extension would not be buried 1 foot per current guidelines. This was proposed due to the potential for a buried culvert to head cut upstream at this site, since the current culvert is not buried and the stream bed material would likely wash downstream. There was much discussion regarding the effects of not embedding the culvert extension. Travis Wilson had no major concern about this issue since the stream channel and culvert are relatively flat and the water is ponded. There was general agreement for this exception. *No action required – culvert design is adequate.*
- Nikki Thomson stated that the two ponds should not be filled strictly due to landowner request but only the amount needed for the roadway construction. *This will be taken into consideration during the design and impacts will be minimized at this location and presented in the 4C meeting. Due to the draining of the ponds, the permit application will still include a total loss of the surface water in the ponds.*
- Nikki Thomson stated that pre-formed scour hole impacts should be minimized to the greatest extent possible at this location. *The preformed scour hole will be located outside the jurisdictional areas.*
- Nikki Thomson asked if the stream and tributary channels northeast of the road are all perennial. *Stream D, the small tributary starting at the existing roadway, was called out as perennial in the NRTR for the project. However, the channel seems to be a stormwater ditch or at most an intermittent stream. USACE representatives will be shown this site during field verification of the borrow area delineations and any changes will be included in the 4C plans.*

**Sheet 8:** No comments.

**Sheet 9:**

- Nikki Thomson asked if the flow line shown below the pipe outlet at Station 70+00 was a jurisdictional stream. *This was a surveyed flow line but the channel is not jurisdictional according to the NRTR mapping and current field conditions.*

**Sheet 10:** Site 2

- Cathy Brittingham asked if the riprap is shown within the stream channel. *The riprap symbols are sized for the approximate amount of riprap required for the pipe size. All plan sheets with riprap at a jurisdictional stream have a note that states no riprap shall be placed in the stream bed.*
- It was noted that potentially only the stream will be impacted at Site 2, every effort will be made to avoid the wetlands.

**Sheet 11:** No comments.

**Sheet 12:** No comments.

**Sheet 13:** Sites 3 and 4

- Chris Militscher inquired as to which streams in the NRTR labeling were impacted by the interchange with Y4 at Site 4. *Portions of streams H, I, J, and K in the NRTR are located within the interchange areas. Impacts will primarily be to streams H, I, and J. Stream H seems to be a drainage pattern within a wetland, and may be checked by USACE during their site visit.*
- Upon discussion, it was determined that the wetlands within the Y4 interchange would be a total take. It was also noted that the stream impacts between culverts would be considered a total take due to the difficulty establishing vegetation in these areas. *This will be reflected in the 4C plans and permit application.*
- If possible, the Ramp A fill slopes will be pulled in to minimize wetland impacts.

**Sheets 14-16:** Sites 6 & 7

- Bill Biddlecome wanted clarification if the borrow pit shown on the plans was jurisdictional. *The borrow pit has a dry overflow connection (non-jurisdictional channel) to the adjacent swamp, but was shown in the NRTR mapping as a pond. This will be field verified by USACE representatives. It has a current borrow permit from NCDLR.*
- The bridge is proposed to be built using top-down construction and driven piles.
- A discussion occurred regarding the proposed stormwater collection system at the bridge, and the following statements were made:
  - Marshall Clawson stated that collection systems could not be placed on cored slab bridges. *Randall Gattis said that a collection system had not been built in North Carolina on a cored slab bridge, but that it could be built.*
  - Marshall stated that this would need approval by David Henderson and Greg Perfetti. *If a closed system is used, designs will be submitted to the Structures and Hydraulics Units for approval.*
  - Travis Wilson stated that direct discharge was not allowed into the surface waters. *Direct discharge into wetlands is proposed as an alternative to a collection system and its maintenance issues. If this is approved, the deck drains will be moved to the middle of the bridge and outlet into the forested wetlands beyond the Cashie River CAMA buffers.*
  - Cathy Brittingham and Nikki Thomson, along with other agencies, agreed that DWQ Stormwater personnel input on the deck drain issue would be critical to the decision about direct discharge versus collection system. *HDR will submit plans to DWQ Stormwater personnel and meet with them to determine the best approach. This will be included in the 4C plan set.*

- NCDOT Hydraulics Unit recommended deck drains, on the Cashie River structures, over wetlands be provided for the alternative submitted to DWQ Stormwater personnel. It was recommended that the deck drains be moved at least 100 feet away from the surface waters and extended towards the end of the bridge (away from the river) and that the spacing be reduced to six feet in order to minimize the discharge from the individual drains. *This alternative will be provided with four inch drains through the cored slab.*
- Cathy Brittingham stated that the impacts from shading of the bridge will be required in the permit application. These impacts will not require mitigation but should be included as “shading effects”. *This information will be included in the permit application.*
- The construction moratorium conditions were reviewed and discussed.
  - The moratorium is in effect from February 15 to September 30
  - Clarification on the condition that work may occur in non-inundated wetlands as long as erosion control measures are in place. Specifically, the apparent contradiction that measures are required prior to working in non-inundated wetlands, but measures cannot be placed in wetlands.  
*This item will be readdressed during 4C.*

**Sheets 16-18:** No comments.

**Sheet 19:**

- Cathy Brittingham asked if the equalizer pipes were buried 1 foot. Discussion ensued regarding the need for the pipes to be buried and the adequacy of hydrologic connections. *It was agreed that the equalizer pipes, spaced 500' apart, were adequate for the site hydrology, which is primarily tree farm wetlands with little standing or flowing water.*
- Nikki Thomson and Bill Biddlecome inquired as to the reason the pipes need to be buried since there is no significant flow through them. *Gary Jordan stated that small amphibians etc would be more likely to use the pipes if they were buried.*
- Chris Militscher asked where the wetland boundary was on the south side of the roadway. *The wetland boundary is not shown because the wetlands extend beyond the ROW and study corridor.*

**Sheets 20-22:** Site 10

- Cathy Brittingham asked for explanation of the silt ditch being retained on the plans. *This was done at the request of the Division to ensure that offsite runoff is moved away from the toe of roadway fill.*
- Chris Militscher asked if the silt ditch would have a drainage effect on the wetlands. *The ditches will only be retained in upland areas and will not affect wetlands since they are only 1' deep.*

**Sheet 23:** Site 11

- Nikki Thomson asked how deep the 36" pipe will be buried in the stream at Site 11. *The pipe is shown as buried 1'. This will be reevaluated prior 4C. It was noted that the stream is not a USGS blueline stream and was noted as an unimportant intermittent stream in the NRTR.*

**Sheets 24:** No comments.

**Sheets 25:** It was noted that the proposed ditch is merely a realignment of an existing ditch.

**Sheets 26:** No comments.

**Sheet 27:** Site 14

- Travis Wilson asked why the equalizer pipe is split. *The pipe is split to provide relief in the gore area of the Y6 interchange.*

**Sheet 28:** Site 14

- Chris Militscher stated that the equalizer pipe in quadrant C is not needed since the site would be a total take in this area. *The equalizer pipe will be retained to provide hydraulic relief at this area. The total take will be included in the 4C plans and the permit application.*
- Chris Militscher stated that the wetlands internal to the interchange in quadrants C and D would be total takes due to their small size and lack of function when the roadway is constructed. There was general concurrence on this point. *This will be included in the 4C plans and permit application.*
- It was noted that the loop was removed from quadrant B to minimize wetland impacts.
- The following points were discussed regarding quadrant A.
  - Chris Militscher suggested that the wetlands internal in quadrant A may not be considered a total take since they are relatively large and may continue to provide water quality functions after the construction is complete.
  - Bill Biddlecome stated that historically these areas internal to interchanges have been considered a total take.
  - Clay Willis suggested that since the wetland is supplied primarily by rainfall and groundwater, the hydrology would be maintained.
  - Gary Jordan asked that if this area is not a total take, that the permit should clearly state that the wetland is not supplied by overbank flow.
  - Phil May stated that if the area does not need to be cleared for construction, orange fencing will be placed around it to protect the remaining wetlands beyond the mechanized clearing zone.
  - Jim Speer suggested that sight distance issues might require clearing within this area.

- *The consideration of quadrant A wetlands as a total take will be further discussed in 4C once the actual impacts, including clearing, have been determined.*

**Sheets 29-36:** No comments.

**Sheet 37:** Site 17

- Bill Biddlecome asked if the wetland at Site 17 is isolated. *The wetland boundary below the road is the edge of the study corridor. The wetland continues off the corridor and is not considered isolated.*

**Sheets 38-52:** No comments.

**Detour Sheets:**

- At Y5, the bridge is on the critical path for construction. Therefore, the approach fills will need to be constructed early in the project. Traffic will be shifted to the northeast on Greens Cross Road to avoid the approach fills. This will create additional impacts associated with the temporary detour. A portion of the detour will remain to provide access to existing Rock Line Road.
- At Y6, Wakelon Road will be replaced on its existing alignment with a bridge over the mainline. To facilitate this construction, traffic will be shifted to the east into Quadrants A and D. This avoids any temporary impacts to wetlands in Quadrant B and complies with the intent of the 4A commitments to avoid impacts in this area. Temporary impacts will only occur in Quadrant A, but this area will be graded and revegetated.

Several other issues were brought up during the meeting for consideration and further discussion in the 4C meeting. These comments are not related to the 4B concurrence but were raised due to the accelerated schedule of the design-build project in order to get feed back on the issues prior to 4C. These included:

- The anticipated permit application date is September 2005. Based on the 100-day agency review period described in the Final RFP for the project, construction is anticipated to begin in January 2006.
- Special sediment control fence within wetlands requiring a separate designation within the mechanized clearing areas.
- Hand clearing methods under the bridge, and more specifically whether the trunks should be dragged out, burned, left in place or hauled off the bridge. There was much discussion about the best method for removing the tree trunks summarized as follows:
  - Dragging trees out would not be allowed due to the length of the bridge.
  - Burning will require impacts related to accessing and stockpiling of the trees as well as permitting from the NC Division of Air Quality.
  - Leaving them in place would potentially create drift and damming issues.

- Hauling trees up to the bridge may impede construction of the bridge and could damage the structure.
- *This will be further evaluated prior to 4C and readdressed at that meeting.*

Rodger Rochelle ended the meeting by asking for and receiving concurrence that the project can move on to the 4C meeting, which is scheduled for August 17, 2005.

Meeting adjourned.

### **June 15, 2005 DWQ-Stormwater Field Review Meeting:**

The following is a summary of the meeting held at the site with Bill Moore, NCDENR Washington Regional Office:

- Upon initial review, direct discharge of the deck drains into the forested wetland areas east of the Cashie River seemed acceptable. Approval for this approach will be dependent on the review of the State Stormwater Permit Application. This approach is based on the fact that the waters are Class C and the deck drains are shifted away from the Cashie River. This will be the proposed method for stormwater management at the bridge and will be incorporated into the State Stormwater Application and the 4C plan set.
- Preformed scour hole locations should be reviewed by the NCDOT Division maintenance engineer. Any structures in locations that may not be accessible for maintenance should be reevaluated. Those located adjacent or near surface waters should be retained. This will be done prior to submission of the State Stormwater Permit Application.
- The DB Team should investigate the use of a soil berm at the toe of slope to act as a level spreader in areas that are appropriate. Currently, the slopes are designed to allow sheet flow as much as possible and a berm would potentially concentrate this flow if it became clogged with debris.
- Soils information should be included with the State Stormwater Application for the detention basins. Site specific soils information will be included.
- Operation and maintenance agreements from NCDOT will be required for the detention basins. This will be included with the permit application.
- The preformed scour holes at the bridge should be shifted to the center of the relatively flat ground between the borrow pit and the Cashie River floodplain. This will allow for the maximum amount of sheet flow and treatment prior to entering the surface water system. The preformed scour hole on the south side of the roadway will remain in place (centered as requested). The north side one will be shifted slightly to comply with this request.

The preceding minutes are the interpretation of the writers and are assumed to be true. Any errors should be directed to the writers as soon as practical.

cc: Meeting attendees  
File

Memo to File  
June 10, 2005  
Page 9

pwm/jjj/jrr/jrh

**TO: FILE**  
**FROM: Jonathan Henderson**  
**DATE: August 24, 2005**  
**SUBJECT: R-2404A Design-Build, 4C Meeting**

---



**Project Name: R-2404A**

On August 17, 2005, following the steps of the “Merger 01” process, the 4C concurrence meeting was held in the Project Services Conference Room at the NCDOT Century Center Complex. In attendance at the meeting were:

Christina Breen	NCDWQ
Gary Jordan	USFWS – Raleigh
Cathy Brittingham	NCDCM
Wanda Gooden	NCDCM
Lynn Mathis	NCDCM
Chris Militscher	USEPA – Raleigh
Bill Biddlecome	USACE – Washington NC
Teresa Bruton	NCDOT Design Build
Shannon Lasater	NCDOT Design Build
Rodger Rochelle	NCDOT Project Services
Anne Gamber	NCDOT Design Build
Scott Emory	NCDOT Div. 1
Bob Capehart	NCDOT Div. 1
Chris Rivenbark	NCDOT NEU
Barney Blackburn	NCDOT Roadside Environmental
Mark Laugisch	NCDOT Roadside Environmental
Randall Gattis	Sanford Contractors, Inc.
Allen Barnhill	Barnhill Contracting Co.
Jimmy Spivey	Barnhill Contracting Co.
Jeff Guill	Barnhill Contracting Co.
Drew Johnson	Barnhill Contracting Co.
Greg Kempf	HDR
Paul Meehan	HDR
Jonathan Henderson	HDR
Phil May	HDR
James Rice	HDR
John Jamison	HDR

Rodger Rochelle began the meeting by reviewing a brief history of the project and its prior concurrence points. After introductions Jonathan Henderson and Phil May began a detailed discussion of the permit impact sheets as described by sites below. Comments not related to a specific station or site, or applying to all sites, are included as general comments below. Italics refer to the response given or action needed to resolve the comment. Underlined text references follow up conversations from the meeting and/or the results of the August 23, 2005 field meeting with USACE.

### **General Comments:**

- It was agreed that one set of permit impact sheets with contours shaded back will be submitted with the application along with a full set of roadway plans. Permit impact sheets without contours will be available upon request.
- Roadside Environmental asked what type of stone would be allowed for the special sediment control fence in the mechanized clearing areas. *#57 stone will be used and the new detail will include geotextile fabric under the stone to minimize disturbance during removal.*
- USACE asked that special sediment control fence be shown on the impact sheets. *It was determined that a detail of the special sediment control fence and the note on the plans would suffice and improve plan clarity. A narrative description will be included in the permit application.*
- Total takes will be included in the impact calculations and discussed in the permit narrative. These areas will not be shaded on the impact sheets in order to avoid confusion with impacted areas during construction.
- The impacts of rip-rap at pipe outlets in wetlands will be included in the impact calculations. Fill will not be shown on the plans under the rip-rap symbology since it would reduce clarity of the permit impact sheets.
- DCM requested that a description of utility relocations be included in the permit. *A utility description will be provided in the permit application.*
- A separate section will be included in the permit to address DCM jurisdictional areas, specifically the Cashie River and adjacent buffers.

### **Site 1:**

- As agreed upon during 4B, the culvert inlet will be placed at the stream bed elevation and not buried, and the downstream endwall will be extended in order to limit impacts to only the inlet end of the culvert.
- The requirement of a haul road through the drained pond was discussed in detail. The roadway and haul road fill would encompass over half the existing pond. Leaving the remaining portion unfilled would require the installation of a drainage pipe that would add mechanized clearing impacts in the undisturbed wetlands below. Although 4B concurrence limited pond fill to that required for project construction, removal of the haul road and pipe could lead to additional impacts. The land owner requested that the pond be filled entirely. *DWQ and DCM deferred this issue to USACE and the decision is pending a field visit on August 23, 2005. Minutes will be updated with results of this field meeting. USACE determined that the pond should be filled entirely and graded to sheet*

flow in order to avoid the need for the drainage pipe and additional mechanized clearing impacts.

- Stream D at station 51+00 Rt. is shown as intermittent unimportant on the impact sheet per USACE field verification dated May 25, 2005. *Bill Biddlecome concurred with this stream call.*
- EPA requested clarification of the impacts requiring mitigation. *The 89 ft. of stream impacts requiring mitigation are for the culvert extension in the perennial channel. The remaining impacts are for a small intermittent unimportant stream below the ponds.*

**Site 2:**

- EPA requested computations for the ditch on the east side of the road and asked if the discharge velocity was non-erosive. *The ditch in question outlets at non-erosive velocity. Ditch computations will be provided on the permit impact sheets in the application.*

**Site 3:** No comments.

**Site 4:**

- Total takes were discussed for wetlands and streams internal to the interchange. Wetlands internal to the -Y4- interchange will be considered total takes due to their isolation and associated loss of function.
- Stream channels internal to the -Y4- interchange in quadrants A and D are not considered total takes. The adjacent undisturbed wetlands provide a buffer from the construction area and therefore the existing limited function of this stream would not be removed. *EPA, USACE, and DCM and USFWS agreed that these streams would not be considered total takes. DWQ will confirm their policy and contact NCDOT. DWQ confirmed on August 19, 2005 that these streams would not be considered total takes.*

**Site 5:**

- Wetland impacts at this location are part of the Cashie River bottomland system. To adhere to previous Merger commitments hand clearing will be performed at this location.

**Site 6:**

- A description was given of the current status of the active borrow pit previously labeled as a pond in the 2002 natural resource report. *USACE will determine jurisdiction of this pit on August 23, and if deemed jurisdictional it will be included as surface water loss. USACE stated that if it is an active borrow pit it is not under 404 jurisdiction. USACE determined that the area is an active borrow pit and would not be considered jurisdictional. A copy of the permit for this borrow area will be provided.*

**Site 7:**

- Hand clearing methods under the proposed bridge were discussed. *All attending agencies agreed that hand clearing and piling and burning, along with walking equipment in and out on felled trees, involves the least impact and is recommended.*

- Bridge shading effects will be included in the permit impact table and in the permit narrative.
- DCM was concerned about the navigational impacts resulting from the placement of piles in the oxbow of the Cashie River. *USACE commented that these were not Section 10 waters and therefore not a USACE issue. DCM will check with their local representative on boat passage requirements at this location and make a final determination if the pier spacing is adequate. Upon checking with local representatives, DCM determined that the current spacing of piers would be adequate.*

**Site 8:** No Comments

**Site 9:**

- The small amount of remaining wetlands in the vicinity of -Y5- at this location will be considered a total take.

**Site 10:**

- As a result of haul road delineations, an updated wetland boundary was provided for review and discussion. *This line is subject to verification during the 8/23 field meeting with USACE. All attending agencies agreed that, if an upland area is present, it should be accounted for appropriately in the permit application. The wetland line was verified on 8/23/05 by Bill Biddlecome and will be included in the permit application. There will be no additional impacts to Site 10 associated with the haul road.*
- The borrow pit associated with the haul road was also reviewed. An isolated wetlands addendum will be included in the permit for NCDWQ review.

**Site 11-13:** No comments

**Site 14:**

- Additional mechanized clearing impacts internal to the -Y6- interchange were reviewed. These additional impacts are required for sight distance. *There was general concurrence that quadrant A was still not considered a total take as discussed at 4B. As requested by USFWS, a note will be included in the permit that this wetland is not supplied by overbank flow.*
- Wetlands within the remaining quadrants (C & D) in the -Y6- interchange are considered total takes.

**Sites 15 - 19:** No comments.

**Borrow Pits:**

- USACE requested that all impacts associated with haul roads be designed as temporary and removed upon completion of construction. *Impacts will be considered temporary and the areas will be regraded to original contours and reforested.*
- The borrow pit designated "IP#3", and its associated haul road, will not be included in the permit application. This pit and road were presented at the 4C meeting pending

Memo to File  
August 24, 2005  
Page 5

USACE verification, but the site was determined to contain wetlands in the timber furrows and therefore will not be used for borrow. This will reduce the proposed impacts from borrow areas and/or haul roads to one temporary road crossing (0.02 acres of riparian wetlands and 49 linear feet of perennial stream) and 0.66 acres of isolated wetlands associated with the IP#1 borrow site.

cc: Meeting attendees  
File

pwm/jjj/jrr/jrh



September 20, 2005

Mr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:  
  
R-2404A, Windsor Bypass, Bertie County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the riverine wetland, non-riverine wetland, and stream compensatory mitigation for the subject project. Based on the information supplied by you in a letter dated September 14, 2005, the revised impacts are located in CU 03010107 of the Roanoke River Basin in the Northern Outer Coastal Plain (NOCP) Eco-Region, and are as follows:

Riverine Wetland Impacts:	4.05 acres
Non-Riverine Wetland Impacts:	65.17 acres
Stream Impacts:	1,354 feet

**This mitigation acceptance letter replaces the mitigation acceptance letter dated August 3, 2005.** The subject project is not listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. Mitigation for this project will be provided in accordance with the above referenced agreement. This project was accelerated and included in the NCDOT's Design Build Program.

EEP will commit to implementing sufficient compensatory riverine and non-riverine wetland mitigation and compensatory stream mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted, in accordance with Section X of the Tri-Party MOA signed on July 22, 2003.

*Restoring... Enhancing... Protecting Our State*



North Carolina Ecosystem Enhancement Program, 1652 Mail Service Center, Raleigh, NC 27699-1652 / 919-715-0476 / [www.nceep.net](http://www.nceep.net)

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

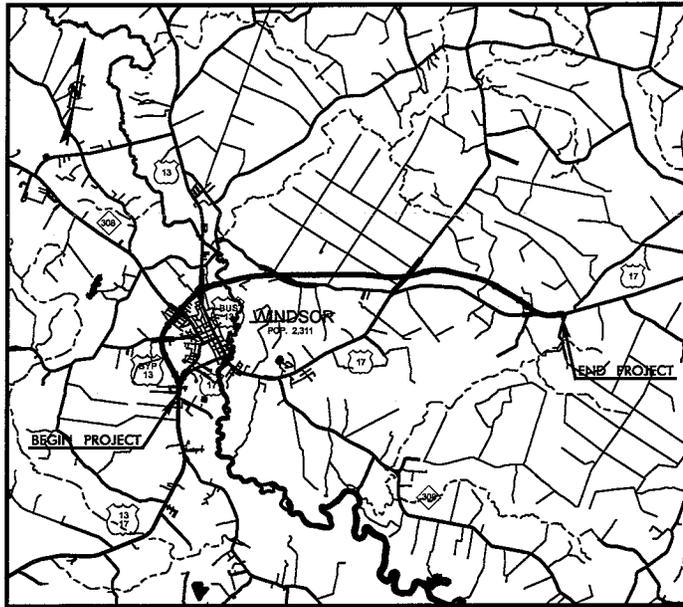
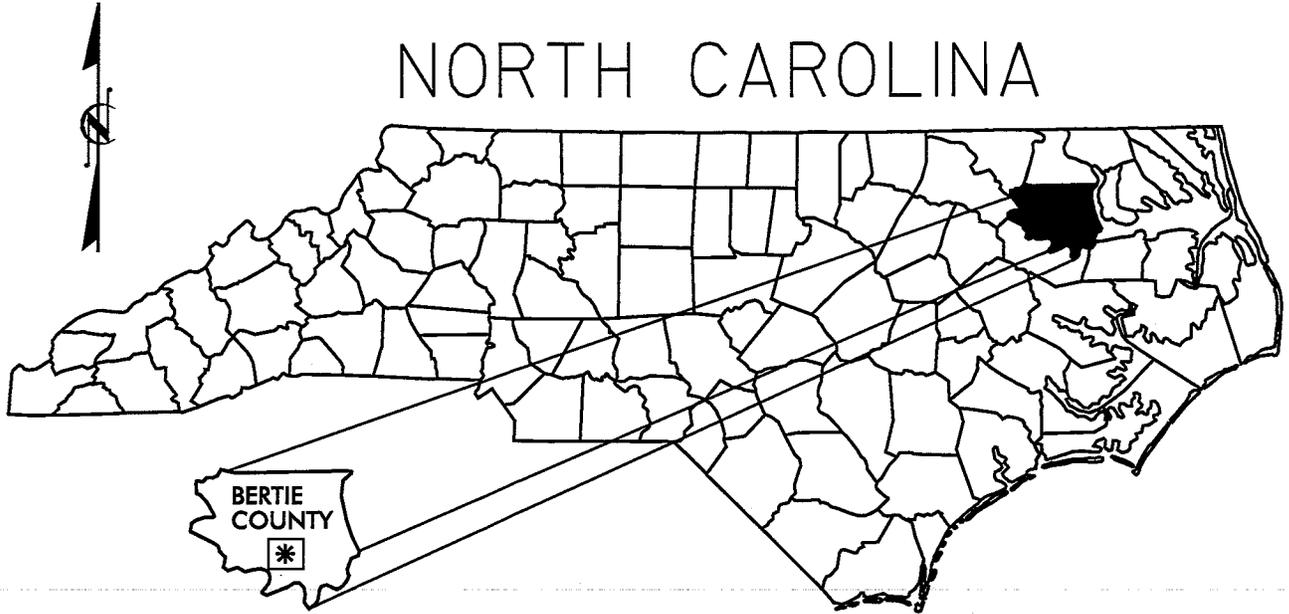
Sincerely,

A handwritten signature in blue ink that reads "James B. Stuntz Jr".

William D. Gilmore, P.E.  
EEP Director

cc: Mr. Bill Biddlecome, USACE-Washington  
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: R-2404A Revised-2

# NORTH CAROLINA



## VICINITY MAPS

### NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

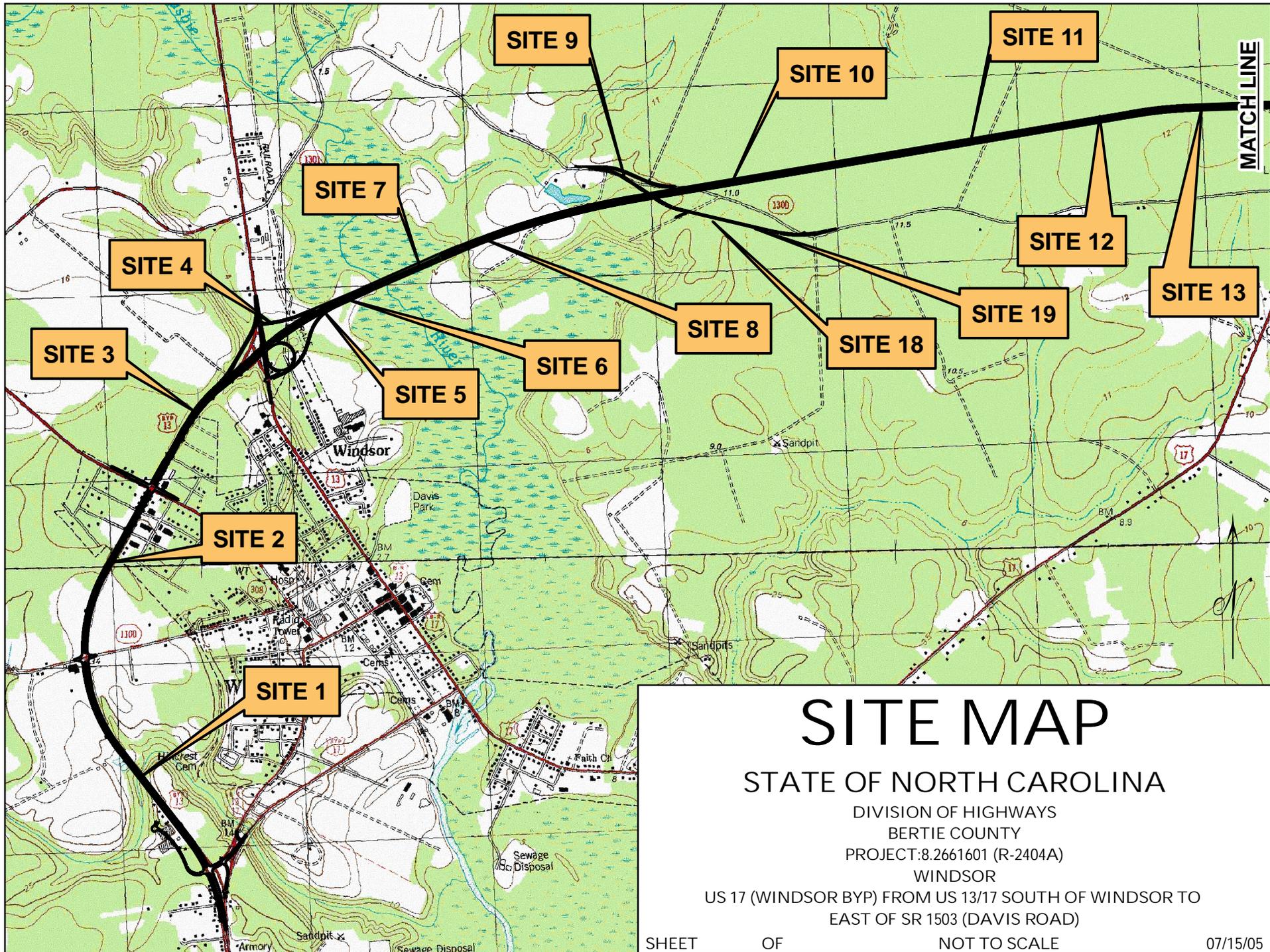
PROJECT: C201236 (R-2204A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17,  
SOUTH OF WINDSOR, TO EAST OF  
SR 1503 (DAVIS ROAD)

SHEET 1 OF 8

7/15/05



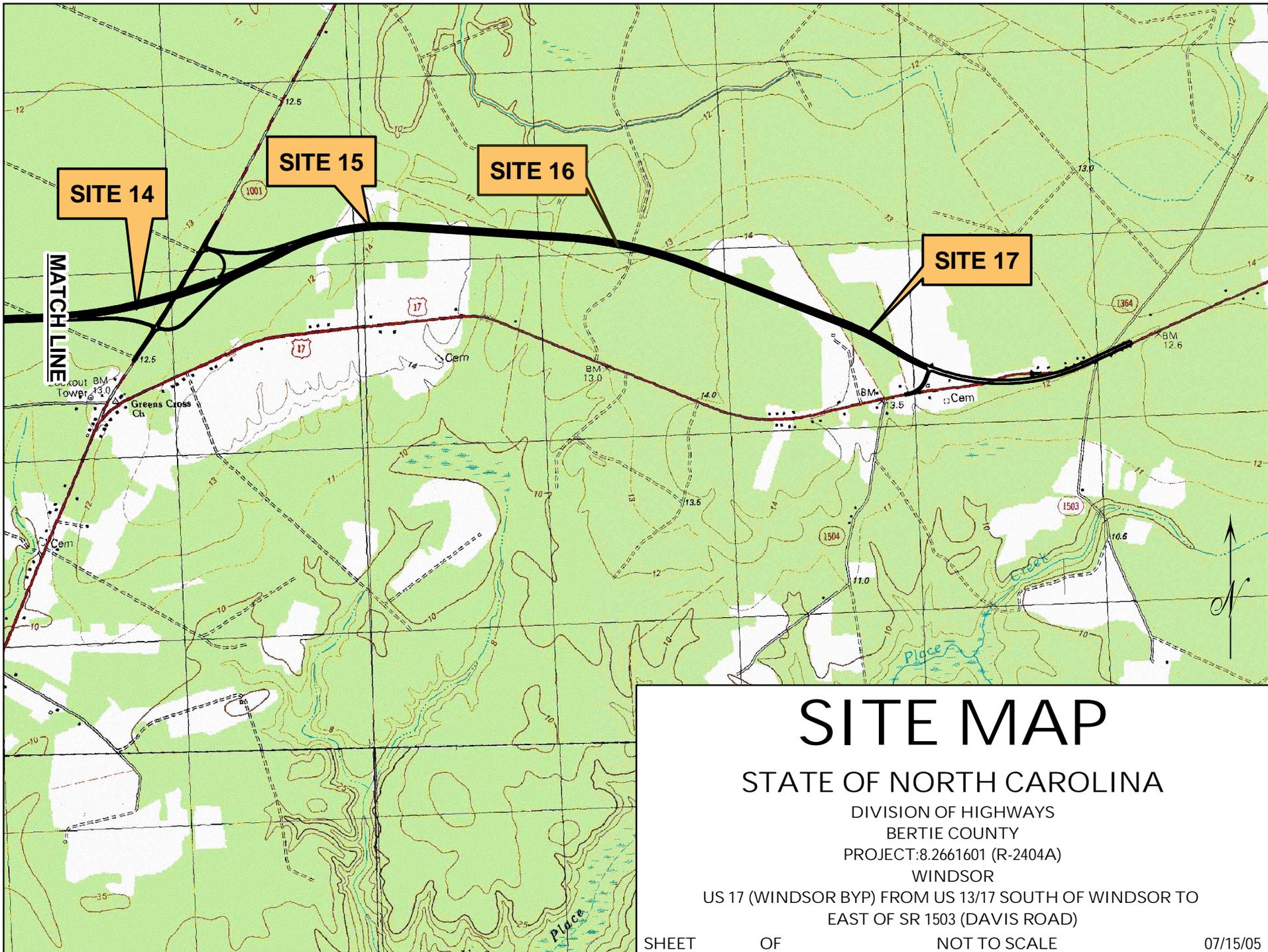
# SITE MAP

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS  
BERTIE COUNTY

PROJECT: 8.2661601 (R-2404A)  
WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17 SOUTH OF WINDSOR TO  
EAST OF SR 1503 (DAVIS ROAD)



# SITE MAP

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

PROJECT:8.2661601 (R-2404A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17 SOUTH OF WINDSOR TO  
EAST OF SR 1503 (DAVIS ROAD)

# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
1	ROBERT D. SESSOMS, JR.	732 CURRYTUCK DR. RALEIGH, NC 27609	1
2	CHARLES N. JACKSON	P.O. BOX 563 WINDSOR, NC 27983	2
3	JUDIE E. BOWEN, JR.	1203 TENNYSON LN. WINDSOR, NC 27983	2
4	POWELL & NEWBY "COBB DEVELOPMENT"	217 US 13 N. WINDSOR, NC 27983	3, 4
5	JANIE C. CHARNICK	12 WALNUT ST. CRISFIELD, MD 21817	4
6	WILLIAM CHARNICK, JR.	8 WALNUT ST. CRISFIELD, MD 21817	4
7	JOSEPH S. ROBERSON	905 COLONIAL LN. WINDSOR, NC 27983	4
8	JO ANN M. FREEMAN	301 COOPER ST. WINDSOR, NC 27983	4
9	MATILDA IVES SMITH	732 CURRYTUCK DR RALEIGH, NC 27609	4
10	CHARLES WHITEHEAD	504 BAZEMORE ST. WINDSOR, NC 27983	4

## NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

PROJECT: C201236 (R-2204A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17,  
SOUTH OF WINDSOR, TO EAST OF  
SR 1503 (DAVIS ROAD)

SHEET

4

OF

8

7/15/05

# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
11	UNKNOWN OWNER		4
12	L.P.MORVEN PARTNERS	P.O.BOX 550 WINDSOR, NC 27983	4
13	PHELPS & WHITE CONSTRUCTION	P.O.BOX 64 WINDSOR, NC 27983	4, 5, 6, 7
14	STANLEY L. THOMPSON	639 GREEN'S CROSS RD. WINDSOR, NC 27983	7
15	HARRY L. THOMPSON	301 S.KING ST. WINDSOR, NC 27983	7, 8, 9
16	KENT WARD	7316 HELMSDALE RD. BETHESDA, MD 20817	9, 10
17	SUSTAINABLE FORESTS, LLC	113 WAKELON RD. WINDSOR, NC 27983	10, 11, 12 13, 14, 18, 19
18	COULBOURN REAL ESTATE, LLC	606 TAYLOR ST. WINDSOR, NC 27983	19
19	RAYMOND G.MIZELLE & SON	504 BAZEMORE ST. WINDSOR, NC 27983	14
20	ARC, INC.	P.O.BOX 2187 KITTY HAWK, NC 27949	14

## NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

PROJECT: C201236 (R-2204A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17,  
SOUTH OF WINDSOR, TO EAST OF  
SR 1503 (DAVIS ROAD)

SHEET 5 OF 8

7/15/05

# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
21	LENORMA S. WATERS	104 BYRD ST. WINDSOR, NC 27983	14,15
22	HOWARD J. ASBELL		16
23	WEYERHAEUSER CO.	P.O. BOX 1391 NEW BERN, NC 28560	16
24	SUSTAINABLE FORESTS, INC.	113 WAKELON RD. WINDSOR, NC 27983	16
25	WEYERHAEUSER CO.	P.O. BOX 1391 NEW BERN, NC 28560	16
26	GEORGE A. HARDEN	1020 US 17 N. WINDSOR, NC 27983	17

### NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

PROJECT: C201236 (R-2204A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17,

SOUTH OF WINDSOR, TO EAST OF

SR 1503 (DAVIS ROAD)



# PERMIT IMPACT SHEET TABLE OF CONTENTS

<u>SITE</u>	<u>PLAN SHEET(S)</u>
SITE 1	6, 7
SITE 2	10
SITE 3	12
SITE 4	13a, 13b, 13c, 13d,
SITE 5	13a, 14
SITE 6	14
SITE 7	14, 15
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SITE 9	18, 46
SITE 10	18, 19, 20, 21, 22
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## NORTH CAROLINA

DIVISION OF HIGHWAYS

BERTIE COUNTY

PROJECT: C201236 (R-2204A)

WINDSOR

US 17 (WINDSOR BYP) FROM US 13/17,

SOUTH OF WINDSOR, TO EAST OF

SR 1503 (DAVIS ROAD)

SHEET 8 OF 8

7/15/05

STATE	STATE PROJECT RESPONSE NO.	PROJECT NO.	TOTAL SHEETS
N.C.	R-2404A	1	
STATE PROJECT NO.	P.A. PROJECT NO.	INTERFERING	
C201236		CONTRACT NO.	
6.01900IT & 34424.1.1		PLANNING & PE	
34424.3.7		CONST.	

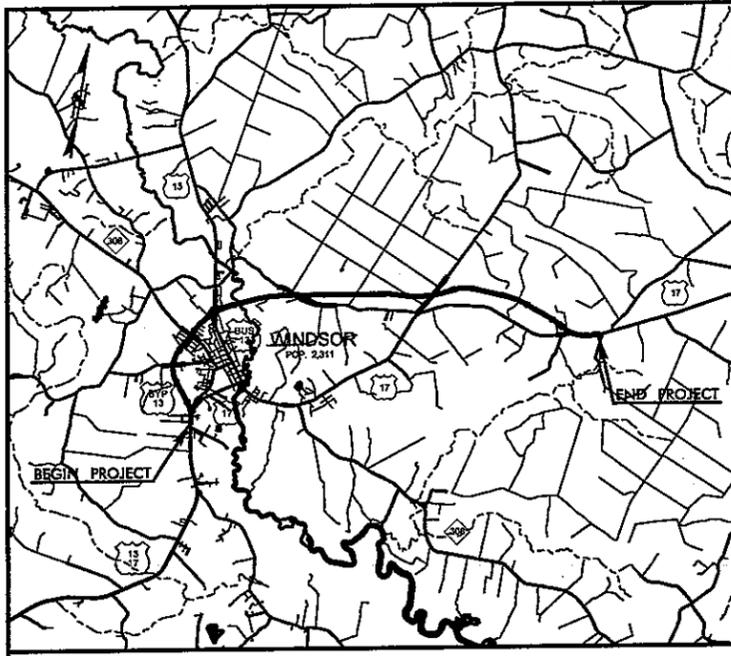
See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

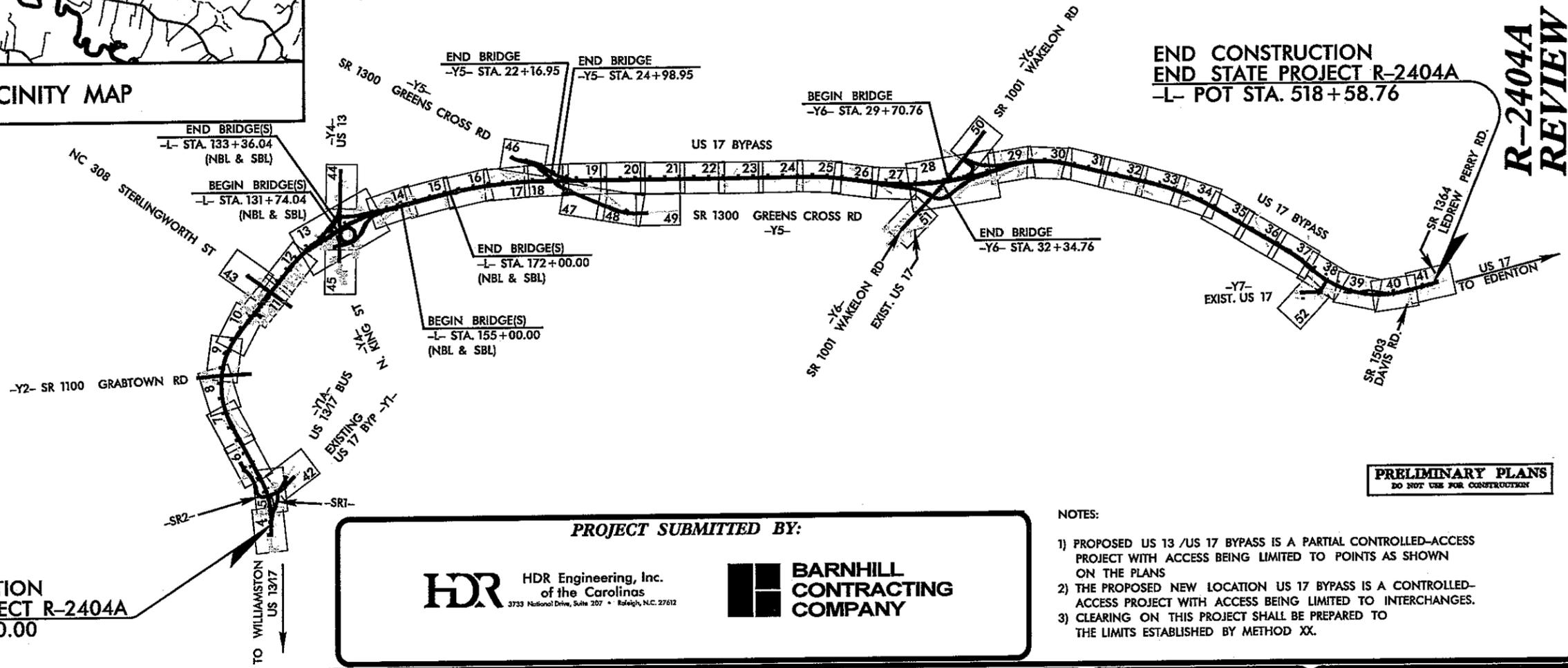
**BERTIE COUNTY**

LOCATION: US 17 (WINDSOR BYPASS) FROM US 13/17, SOUTH OF WINDSOR, TO EAST OF SR 1503 (DAVIS ROAD)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPES OF WORK CONTAINED IN THE DESIGN-BUILD PACKAGE



VICINITY MAP



END CONSTRUCTION  
END STATE PROJECT R-2404A  
-L- POT STA. 518+58.76

BEGIN CONSTRUCTION  
BEGIN STATE PROJECT R-2404A  
-L- POT STA. 12+00.00

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

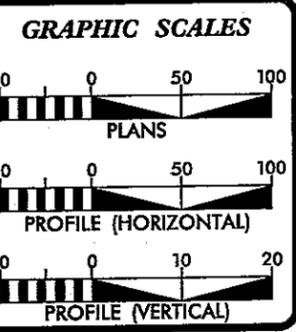
NOTES:

- 1) PROPOSED US 13 /US 17 BYPASS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS
- 2) THE PROPOSED NEW LOCATION US 17 BYPASS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
- 3) CLEARING ON THIS PROJECT SHALL BE PREPARED TO THE LIMITS ESTABLISHED BY METHOD XX.

PROJECT SUBMITTED BY:

**HDR** HDR Engineering, Inc.  
of the Carolinas  
3733 National Drive, Suite 207 • Raleigh, N.C. 27612

**BARNHILL CONTRACTING COMPANY**



DESIGN DATA

ADT 2004 =	12,500
ADT 2025 =	21,300
DHV =	12 %
D =	55 %
T =	12 % *
V =	70 mph
* TTST 8% DUAL 4%	
Functional Class: Freeway	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2404A	=	9.241 MILES
LENGTH BRIDGE TIP PROJECT R-2404A	=	0.353 MILES
TOTAL LENGTH STATE PROJECT R-2404A	=	9.594 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS NCDOT CONTACT:

LETTING DATE:  
DECEMBER 23, 2004

**RODGER ROCHELLE, PE**  
STATE ALTERNATIVE DELIVERY SYSTEMS ENGINEER  
DESIGN-BUILD PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED  
DIVISION ADMINISTRATOR

DATE

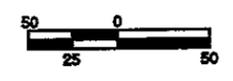
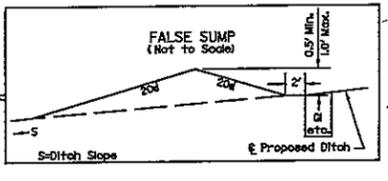
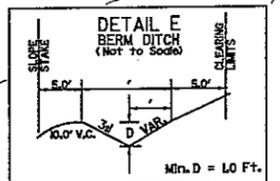
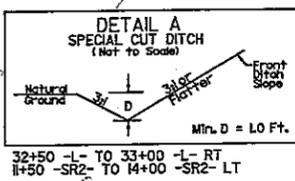
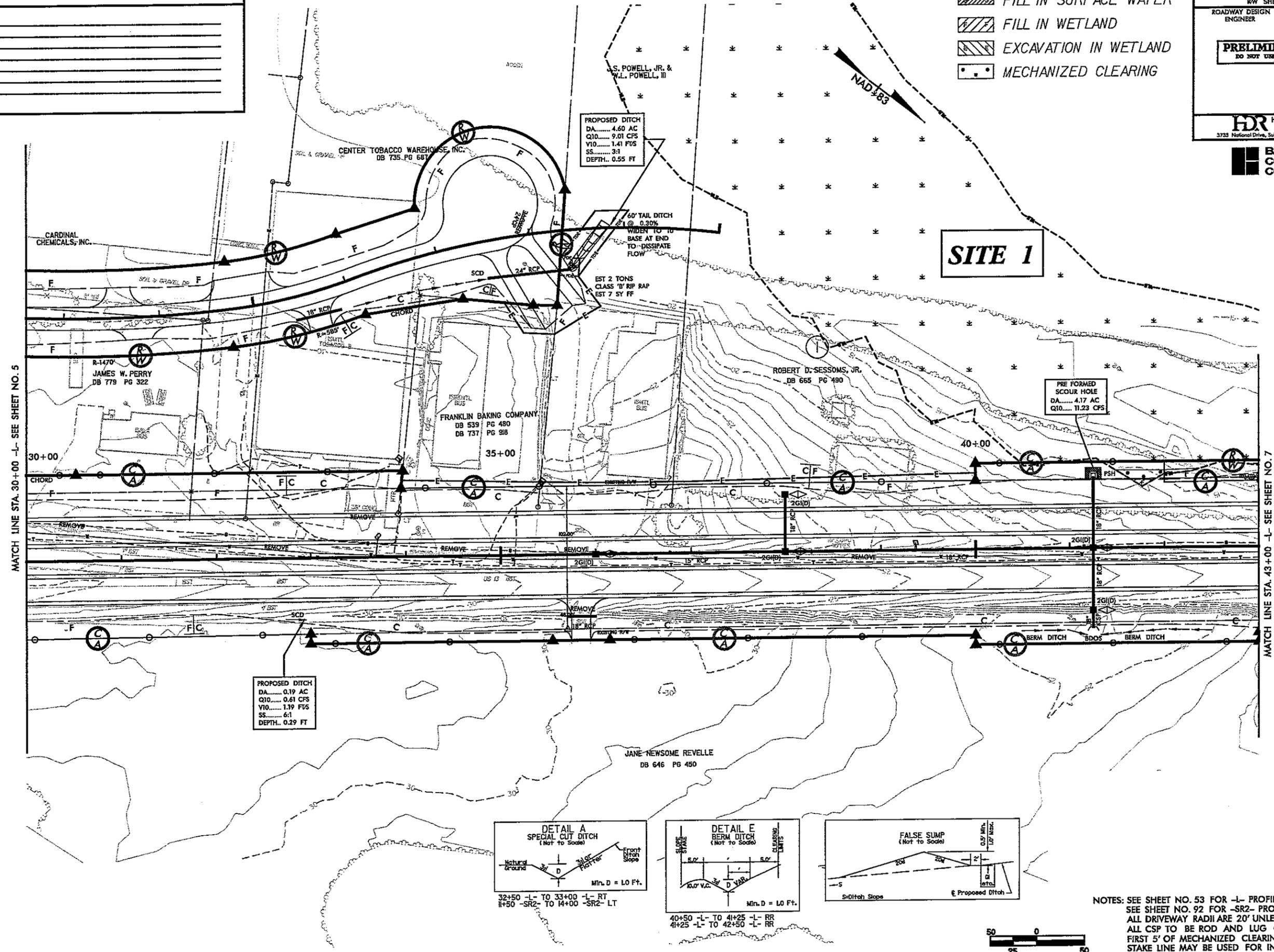
PROJECT: R-2404A C201236

9/8/2005 9:44:13 AM 404A\Permitting\Impact\_Sheets\R2404A\_hyl\_impacts\_tsh.dgn

R-2404A PERMIT REVIEW SET

REVISIONS

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING



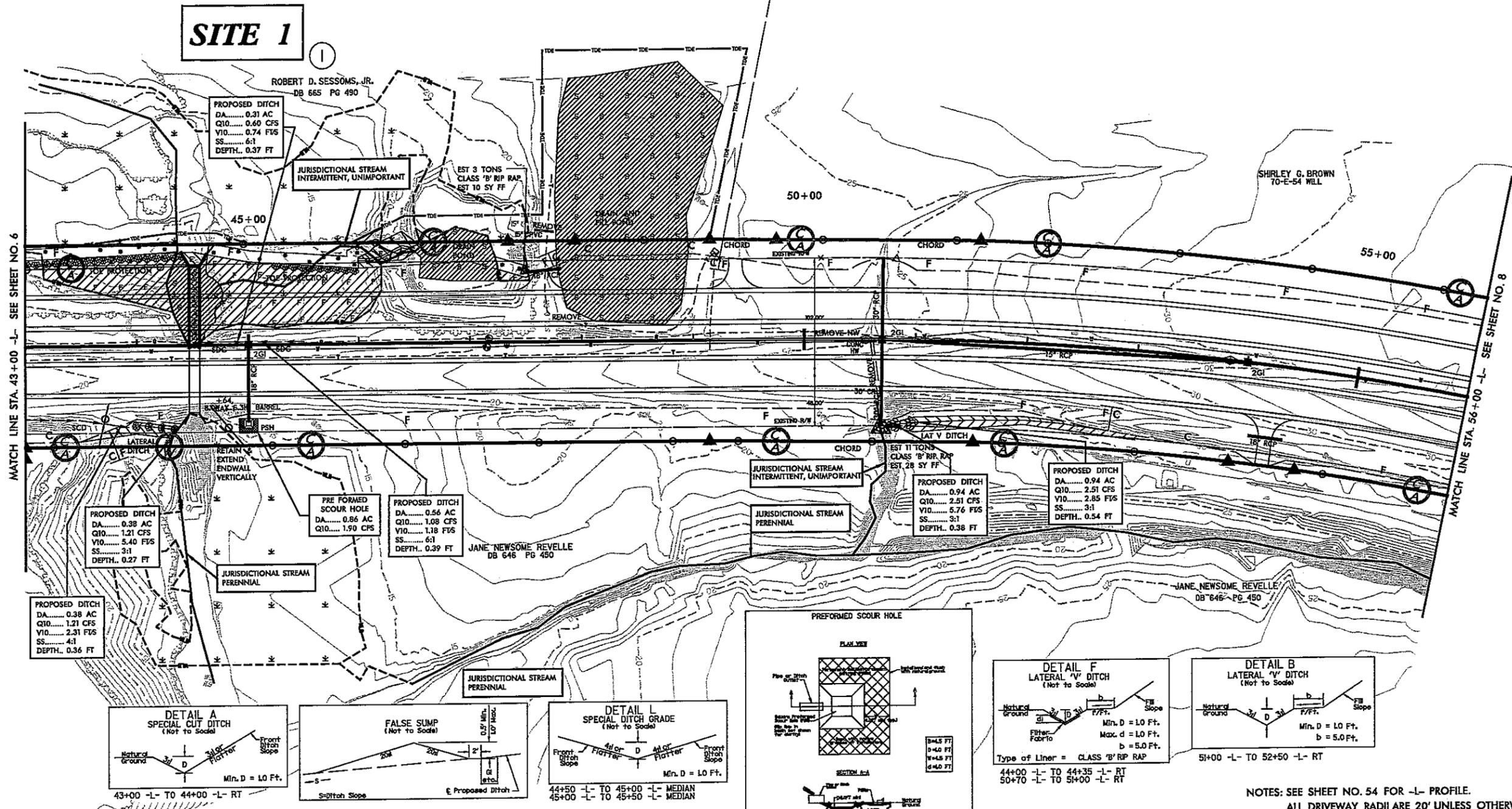
NOTES: SEE SHEET NO. 53 FOR -L- PROFILE.  
SEE SHEET NO. 92 FOR -SR2- PROFILE.  
ALL DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED.  
ALL CSP TO BE ROD AND LUG CONNECTED.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

8/24/2009 10:45 AM C:\Users\jmc\Documents\2404A.dwg jmc\projects\2404.dwg

PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>7</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	
<b>BARNHILL CONTRACTING COMPANY</b>	

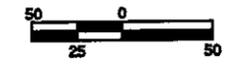
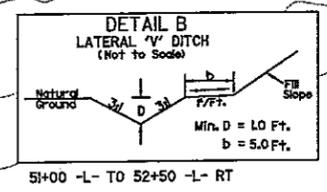
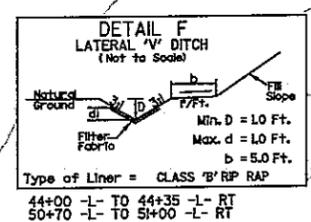
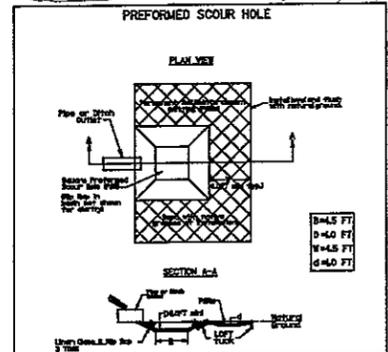
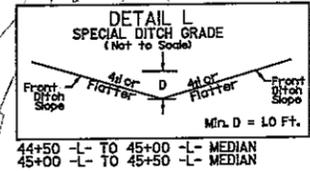
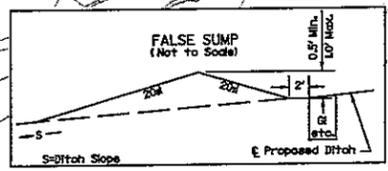
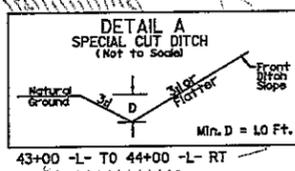
- SURFACE WATER IMPACTS
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING

REVISIONS



MATCH LINE STA. 43+00 -L- SEE SHEET NO. 6

MATCH LINE STA. 56+00 -L- SEE SHEET NO. 8



NOTES: SEE SHEET NO. 54 FOR -L- PROFILE.  
ALL DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED.  
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

9/9/2005 10:45 AM D:\proj\2404\Drawings\Site\2404\_7.dwg

**PLAN SUMMARY DATA**  
44+51.50 -L-

DRAINAGE AREA..... 2.18 SQ.MI.  
DESIGN FREQUENCY..... 50 YR.  
DESIGN DISCHARGE..... 580 CFS  
DESIGN HW.ELEVATION..... 18.0 FT  
Q100 DISCHARGE..... 730 CFS  
Q100 HW.ELEVATION..... 20.0 FT  
OVERTOPPING FREQUENCY... 100+ YR  
OVERTOPPING DISCHARGE... 761 CFS  
OVERTOPPING ELEVATION... 20.60 FT

PI = 44+70.00  
EL = 18.87'  
K = 185  
VC = 520.00'

PI = 49+50.00  
EL = 25.56'  
K = 7056  
VC = 200.00'

8" x 8" RCBC  
STA 44+51.50  
INV. IN = 9.40'  
INV. OUT = 7.30'

**SITE 1**

BEGIN SDG  
STA 44+50.00  
EL = 18.35'  
MEDIAN

END SDG  
STA 45+50.00  
EL = 18.57'  
MEDIAN

END SDG  
BEGIN LAT. V. DITCH  
STA 44+00.00  
EL = 15.14' RT

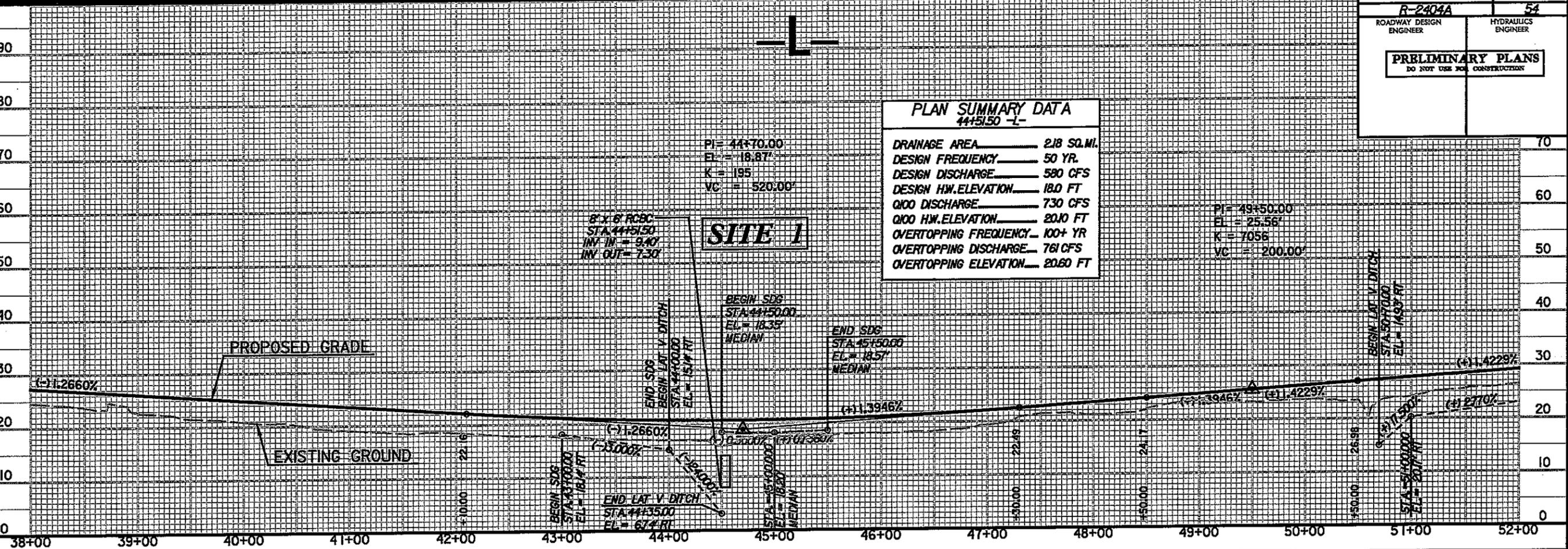
BEGIN SDG  
STA 43+00.00  
EL = 18.44' RT

END LAT. V. DITCH  
STA 44+35.00  
EL = 6.74' RL

BEGIN SDG  
STA 45+00.00  
EL = 18.80'  
MEDIAN

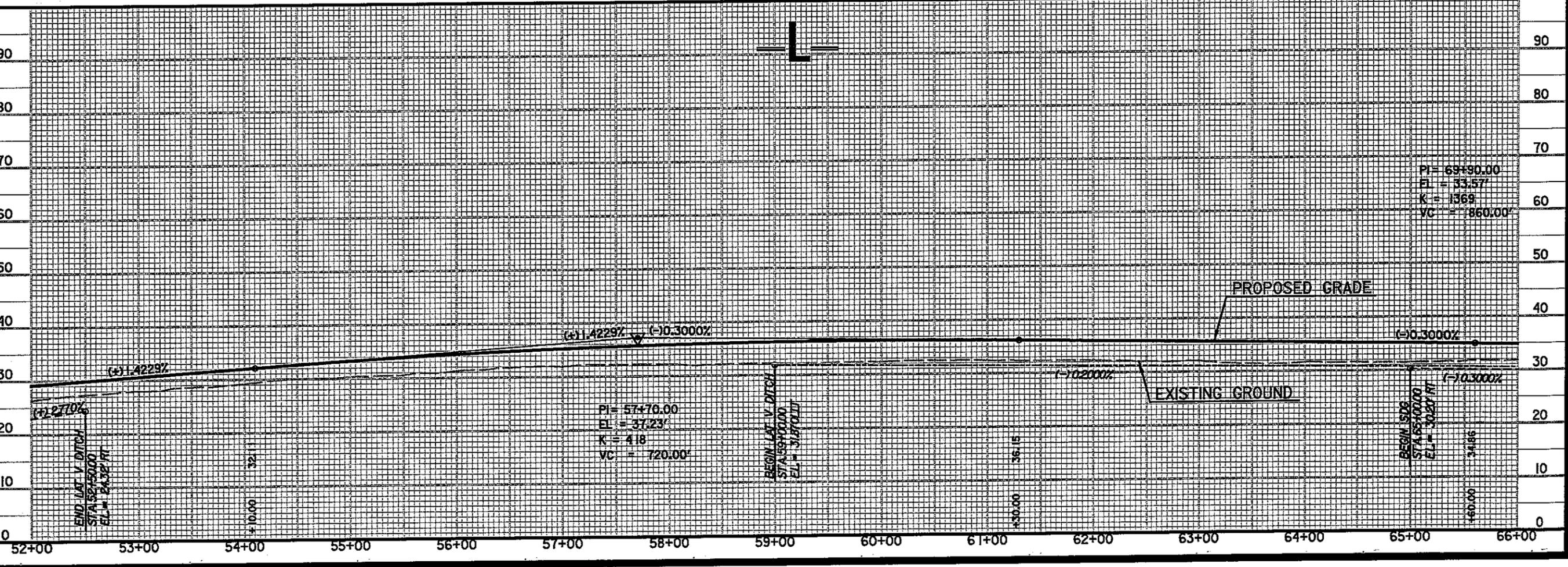
BEGIN LAT. V. DITCH  
STA 50+00.00  
EL = 14.83' RT

BEGIN SDG  
STA 50+00.00  
EL = 20.00'  
RT



PI = 69+90.00  
EL = 33.57'  
K = 1369  
VC = 860.00'

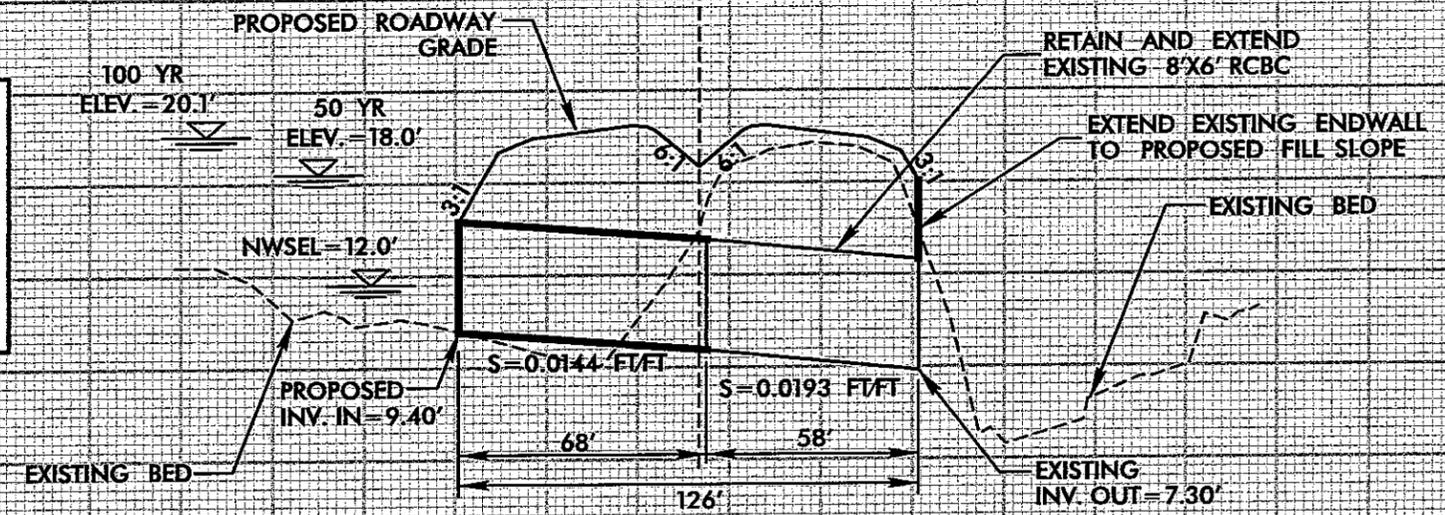
PI = 57+76.00  
EL = 37.23'  
K = 418  
VC = 720.00'



# SITE 1 R-2404A

C STA. 44+51.50 -L-  
 GRADE POINT ELEV. = 20.59'  
 SKEW = 90°  
 RETAIN AND EXTEND  
 8'X6' RCBC

CUVERT HYDRAULIC DATA	
STA. 44+51.50 -L-	
DRAINAGE AREA.....	2.18 SQ. MI.
DESIGN DISCHARGE.....	580 CFS
DESIGN FREQUENCY.....	50 YR
DESIGN HIGH WATER ELEV....	18.0 FT
BASE DISCHARGE.....	730 CFS
BASE HIGH WATER ELEV.....	20.1 FT
OVERTOPPING FREQUENCY....	100 YR +
OVERTOPPING DISCHARGE....	761 CFS
OVERTOPPING ELEV.....	20.6 FT



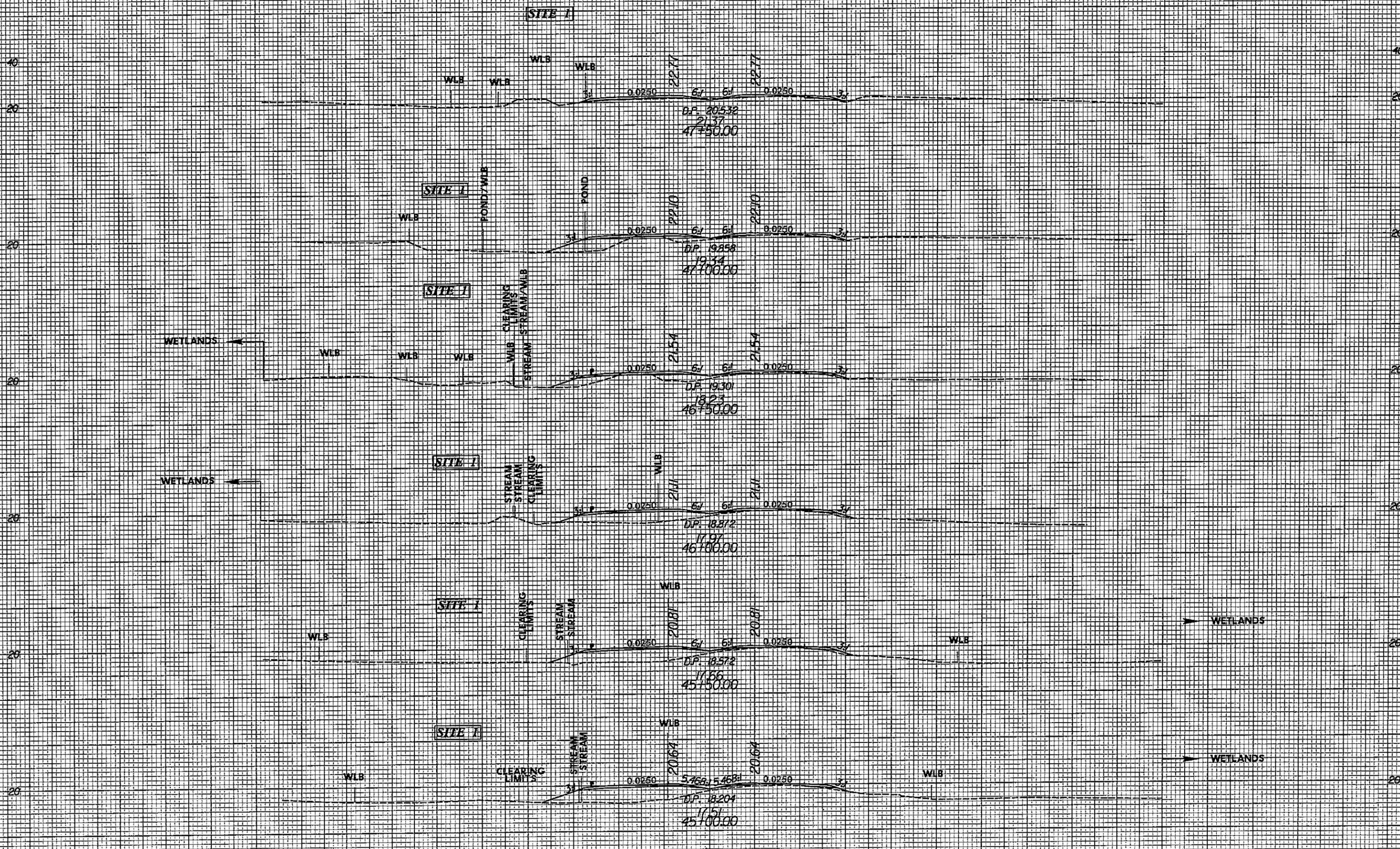
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5/28/99

8/8/2005  
9:43 AM

8/23/99

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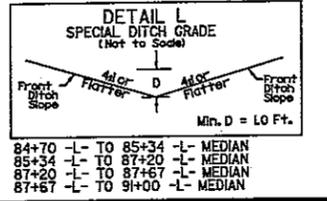
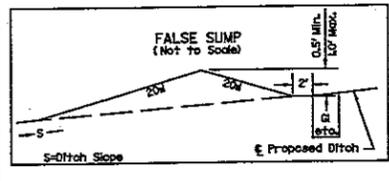
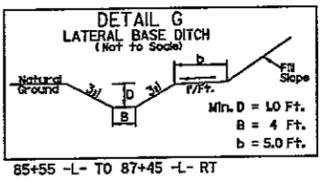
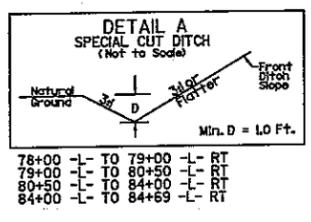
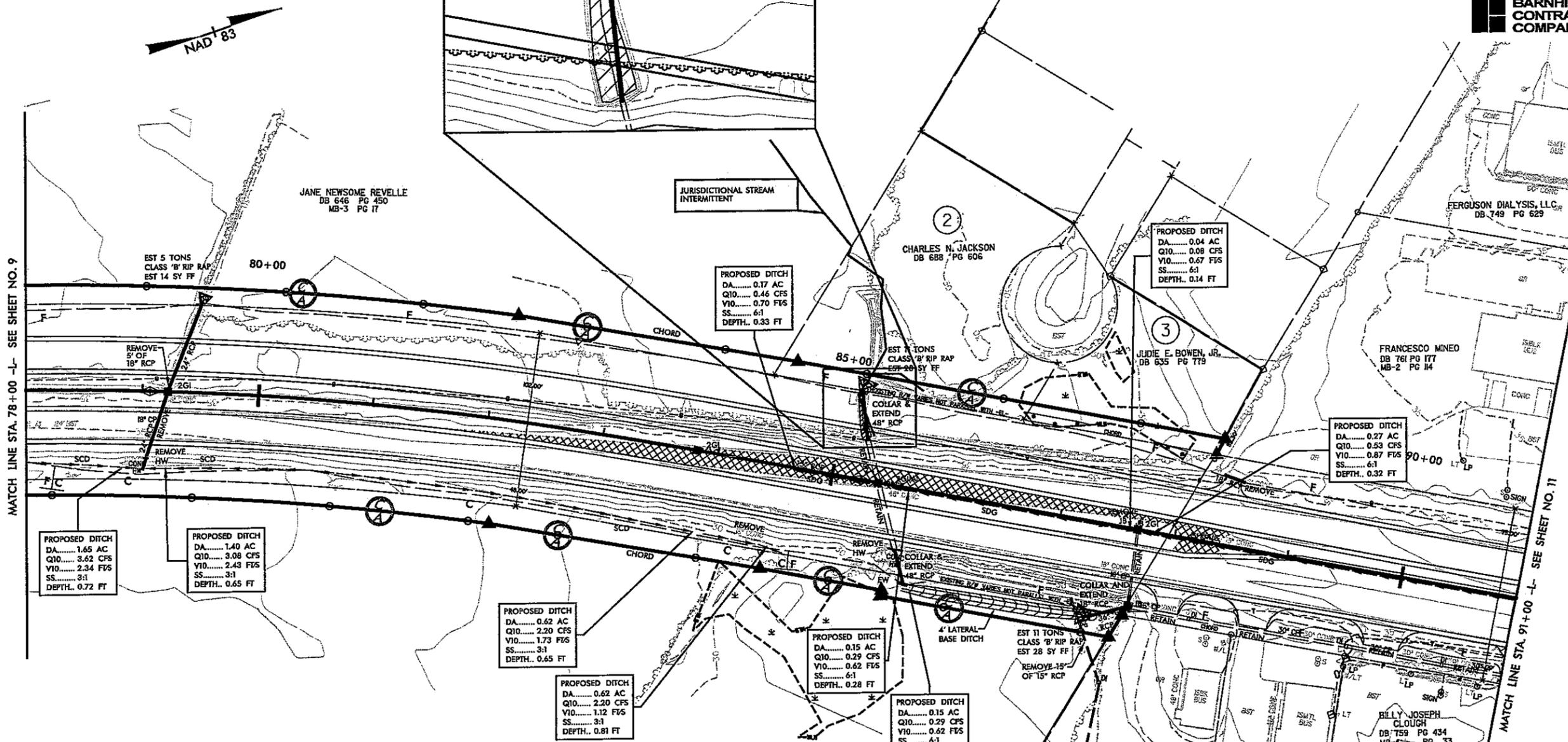


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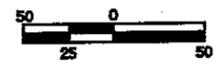
-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING

REVISIONS



**SITE 2**

NOTES: SEE SHEET NO. 55-56 FOR -L- PROFILE.  
ALL DRIVEWAY RADII ARE 20' UNLESS OTHERWISE NOTED.  
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.



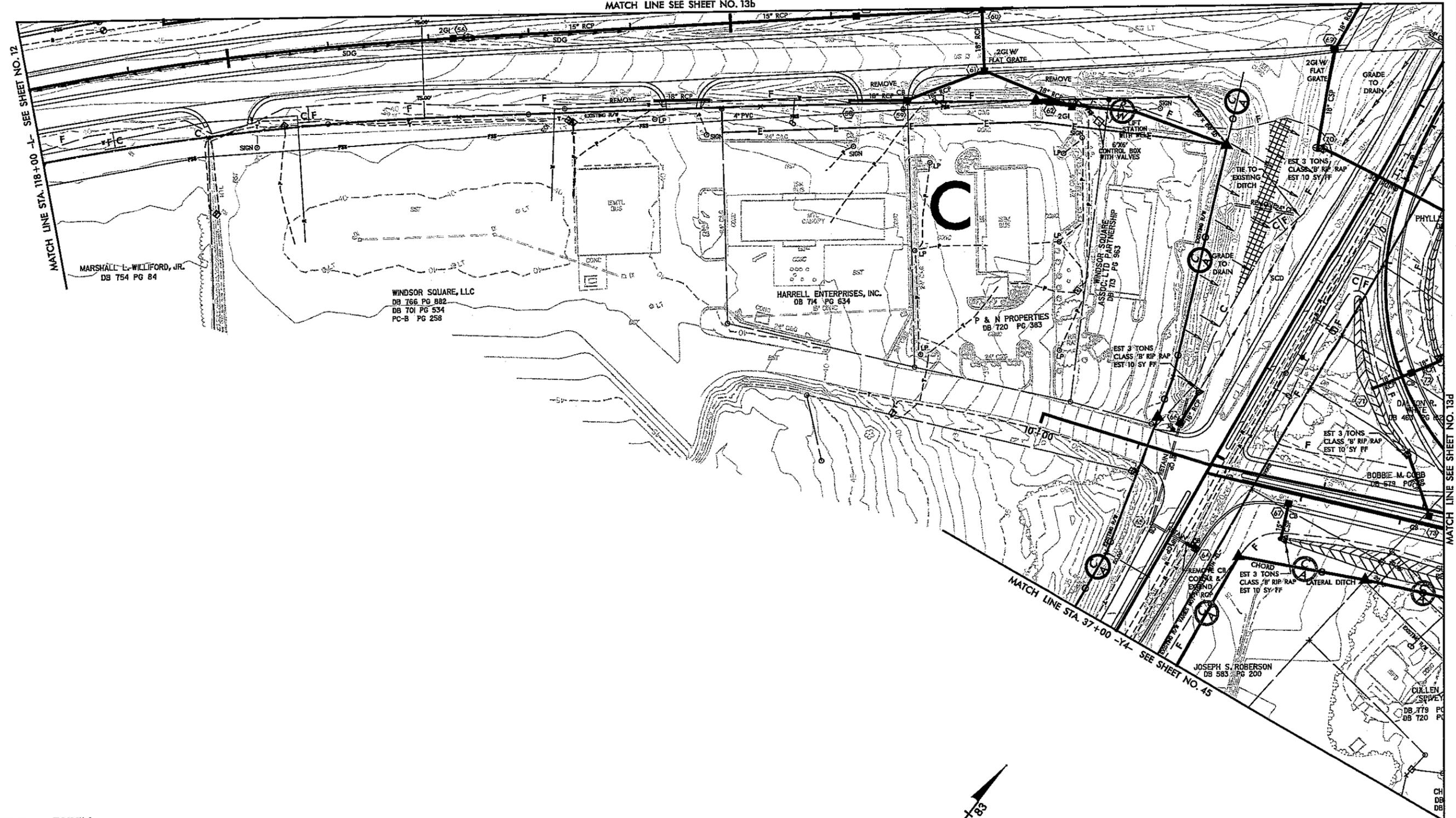
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MATCH LINE SEE SHEET NO. 13b

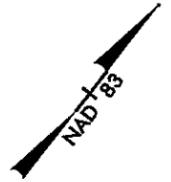
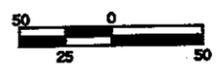


PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>13c</b>
R/W SHEET NO. ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING

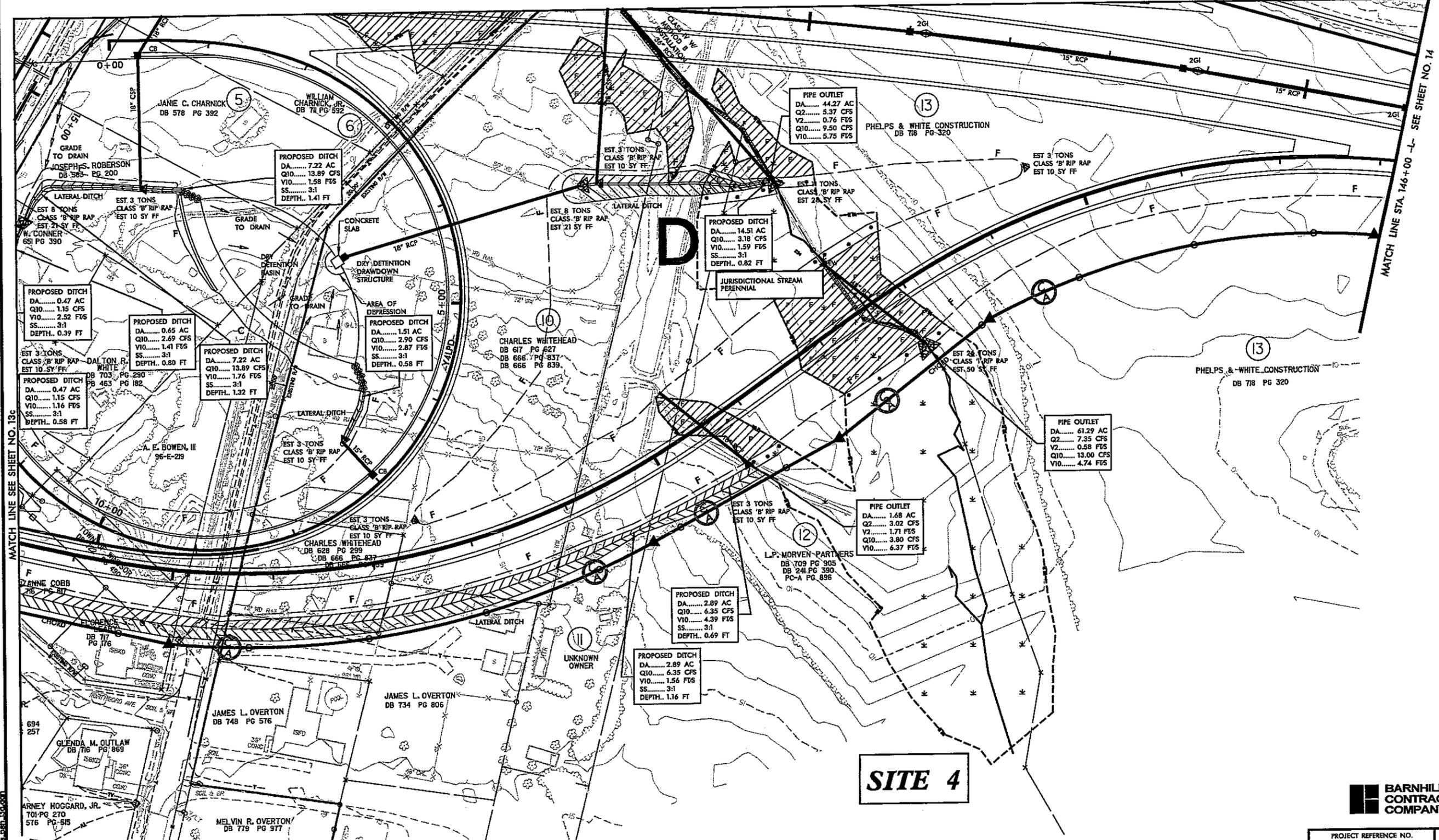
NOTES:

- PAVEMENT TO BE OBLITERATED
- SEE SHEETS NO. 58-59 FOR -L- PROFILE.
- SEE SHEET NO. 76 FOR -Y4- PROFILE.
- SEE SHEET NO. 77 FOR -Y4RPA- PROFILE.
- SEE SHEET NO. 78 FOR -Y4RPB- PROFILE.
- SEE SHEET NO. 79 FOR -Y4RPD- PROFILE.
- SEE SHEET NO. 80 FOR -Y4LPD- PROFILE.
- SEE SHEET NO. 81 FOR -Y4LPDSPUR- PROFILE.
- SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.
- ALL CSP TO BE ROD AND LUG CONNECTED.
- DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
- FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.



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 2/24/2005

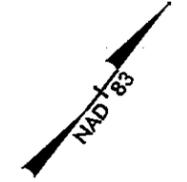
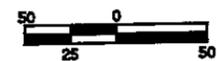
MATCH LINE SEE SHEET NO. 13b



**SITE 4**

-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING

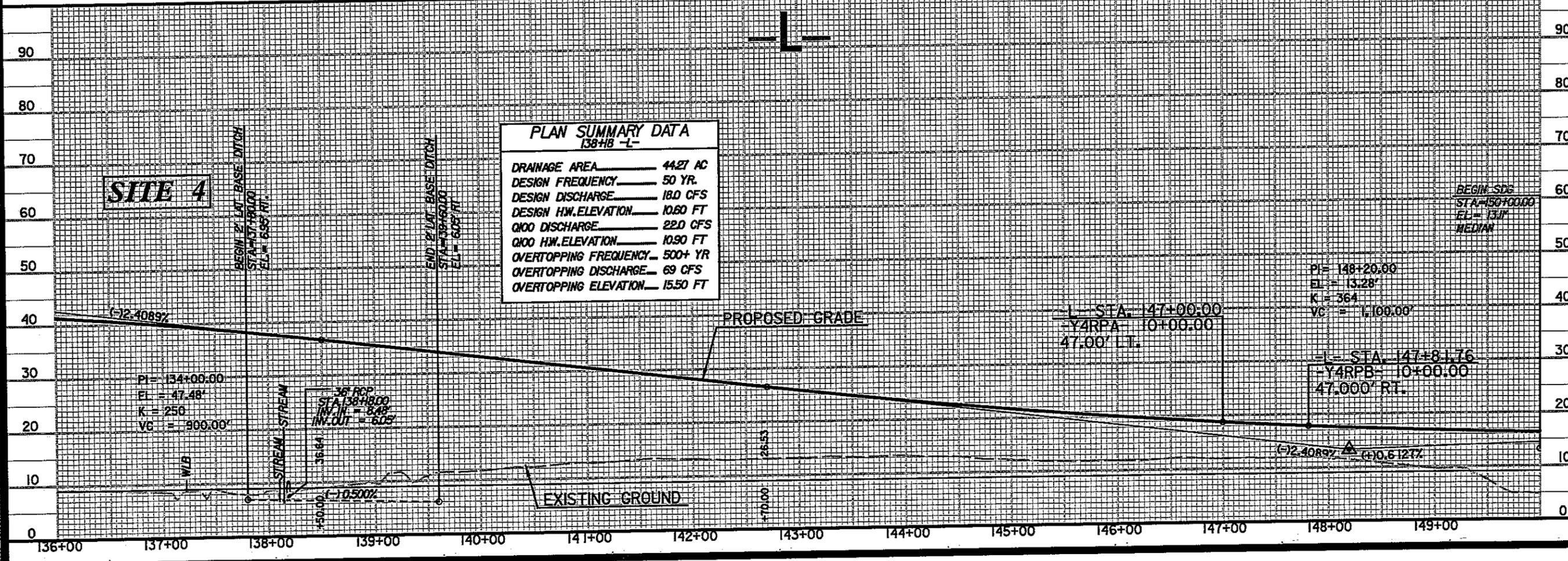
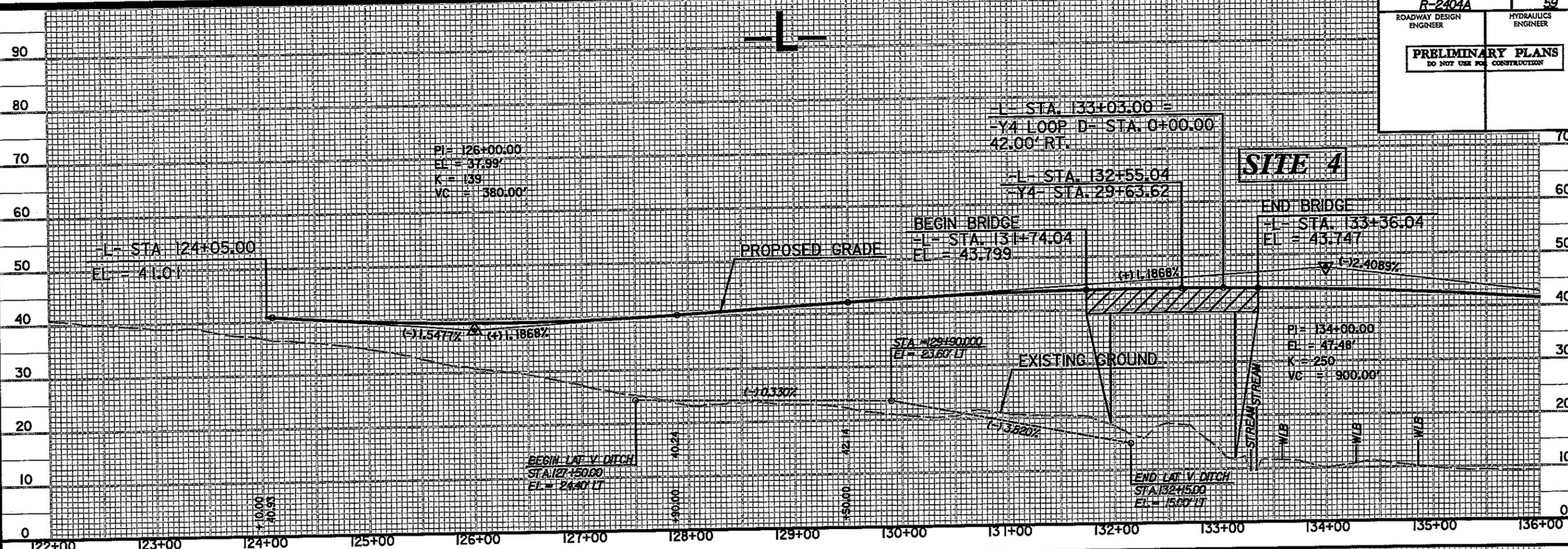
NOTES: FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.



**BARNHILL CONTRACTING COMPANY**

PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>13d</b>
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
<b>HDR</b> HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	

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9/23/2005



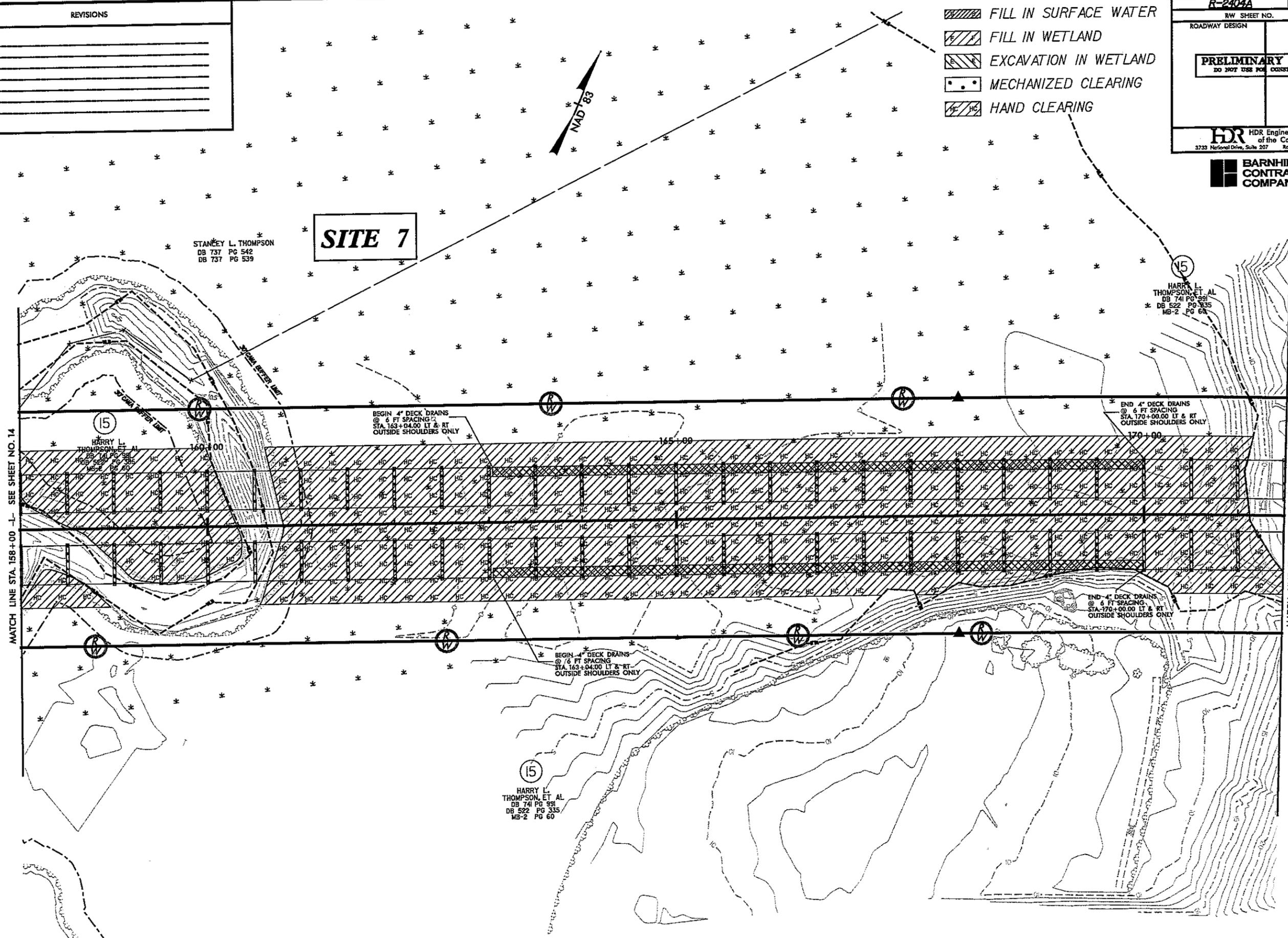


PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>15</b>
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 <b>HDR</b> HDR Engineering, Inc. of the Carolinas 3723 National Drive, Suite 207 Raleigh, N.C. 27612	

**BARNHILL CONTRACTING COMPANY**

REVISIONS

-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING
-  HAND CLEARING

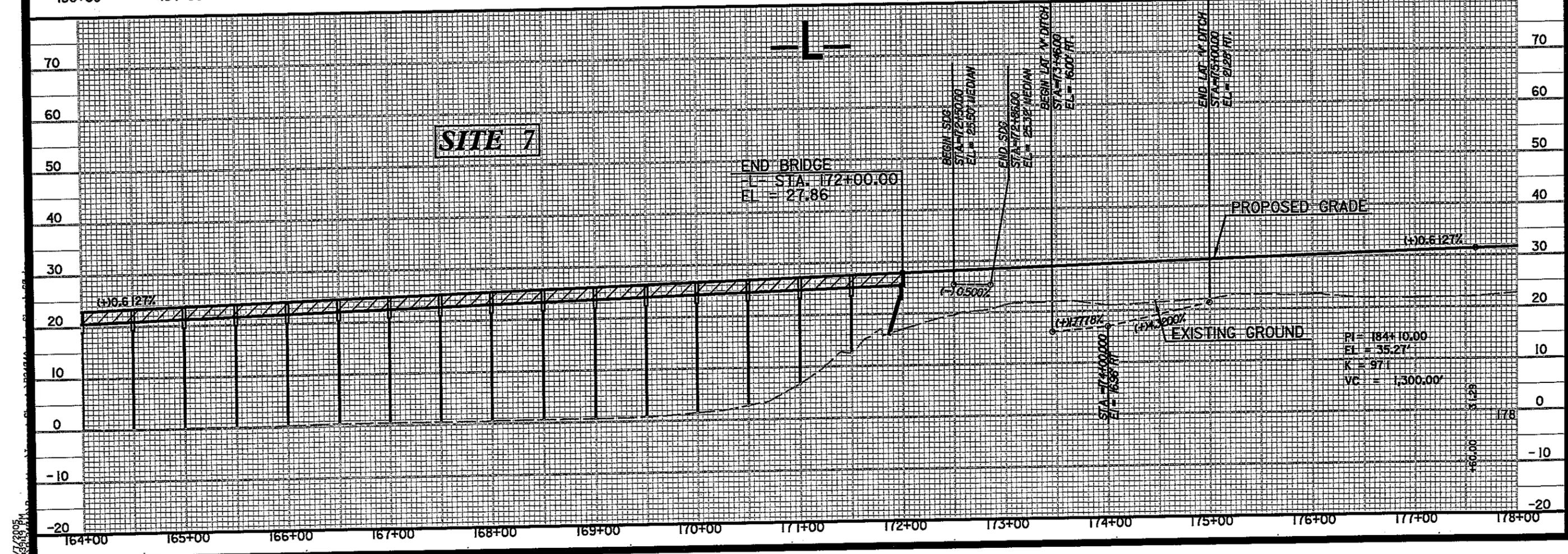
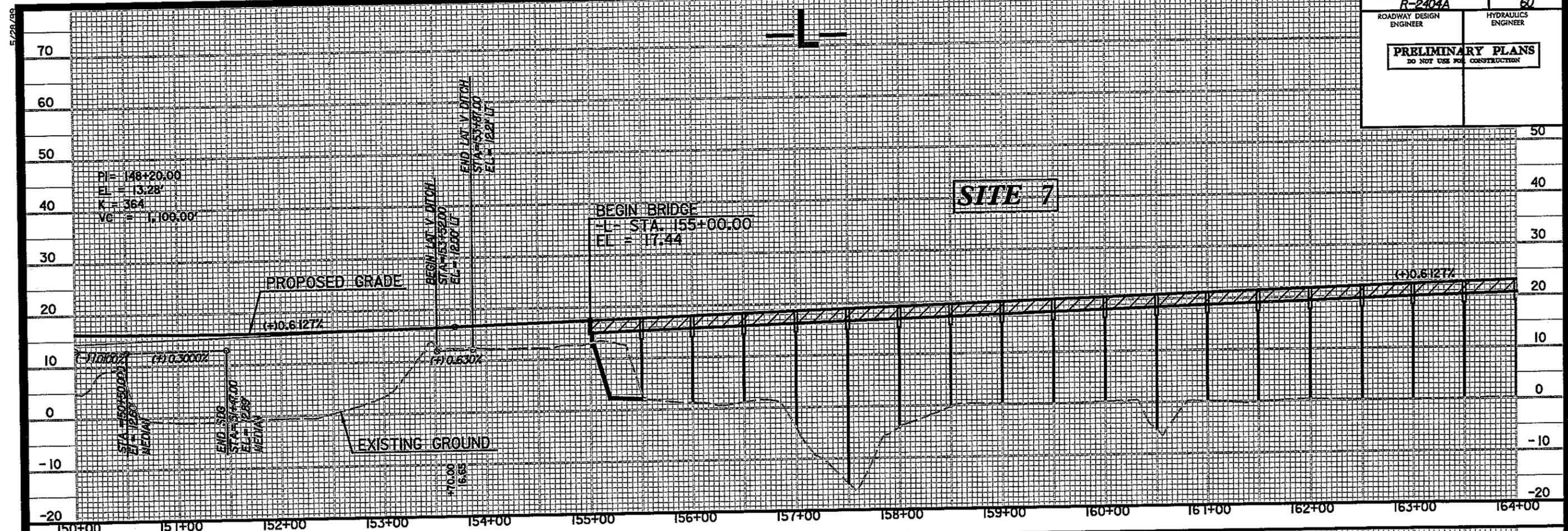


MATCH LINE STA. 158+00 -L- SEE SHEET NO. 14

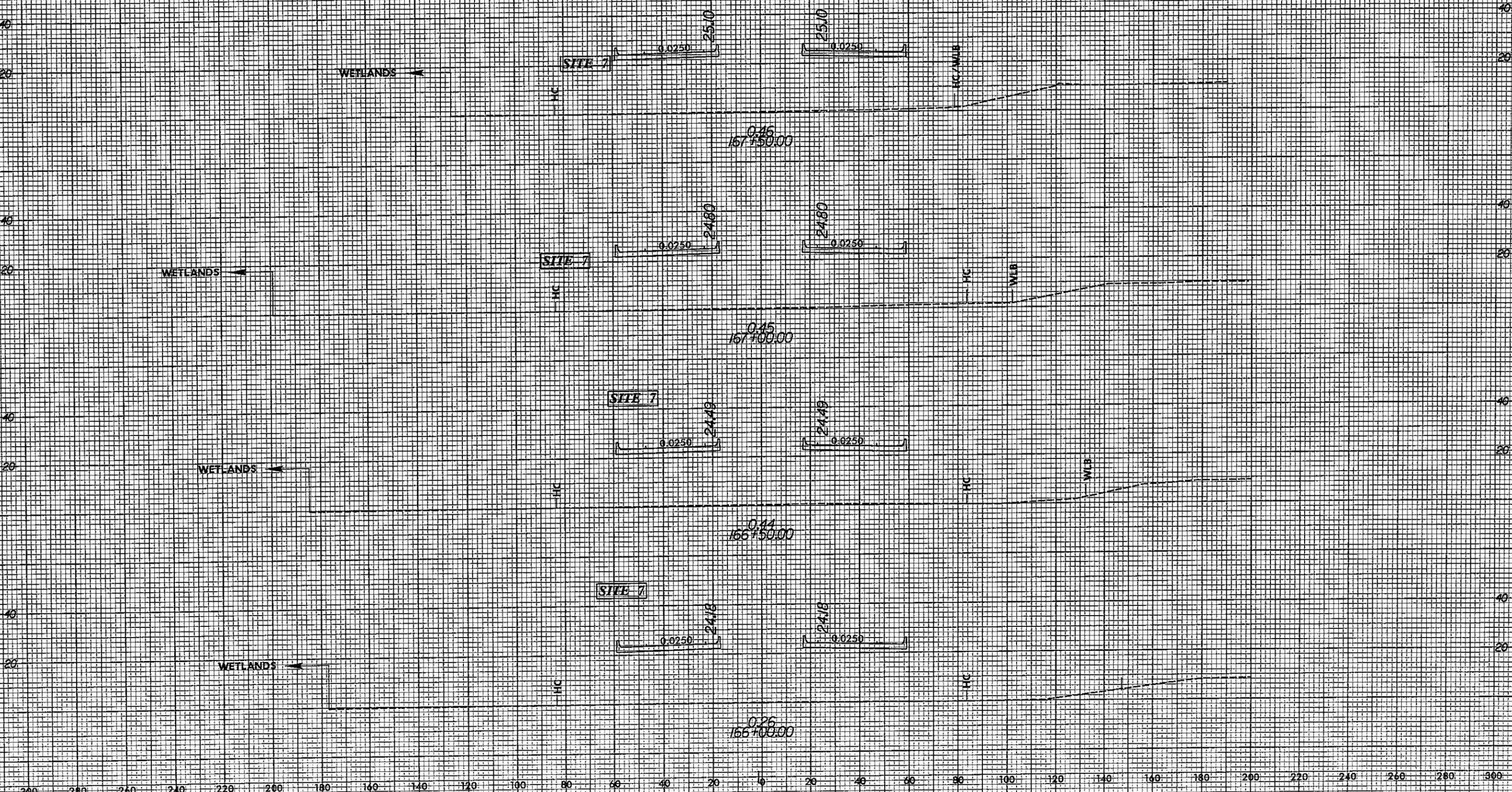
MATCH LINE STA. 171+50 -L- SEE SHEET NO. 16

NOTES: SEE SHEET NO. 60 FOR -L- PROFILE.

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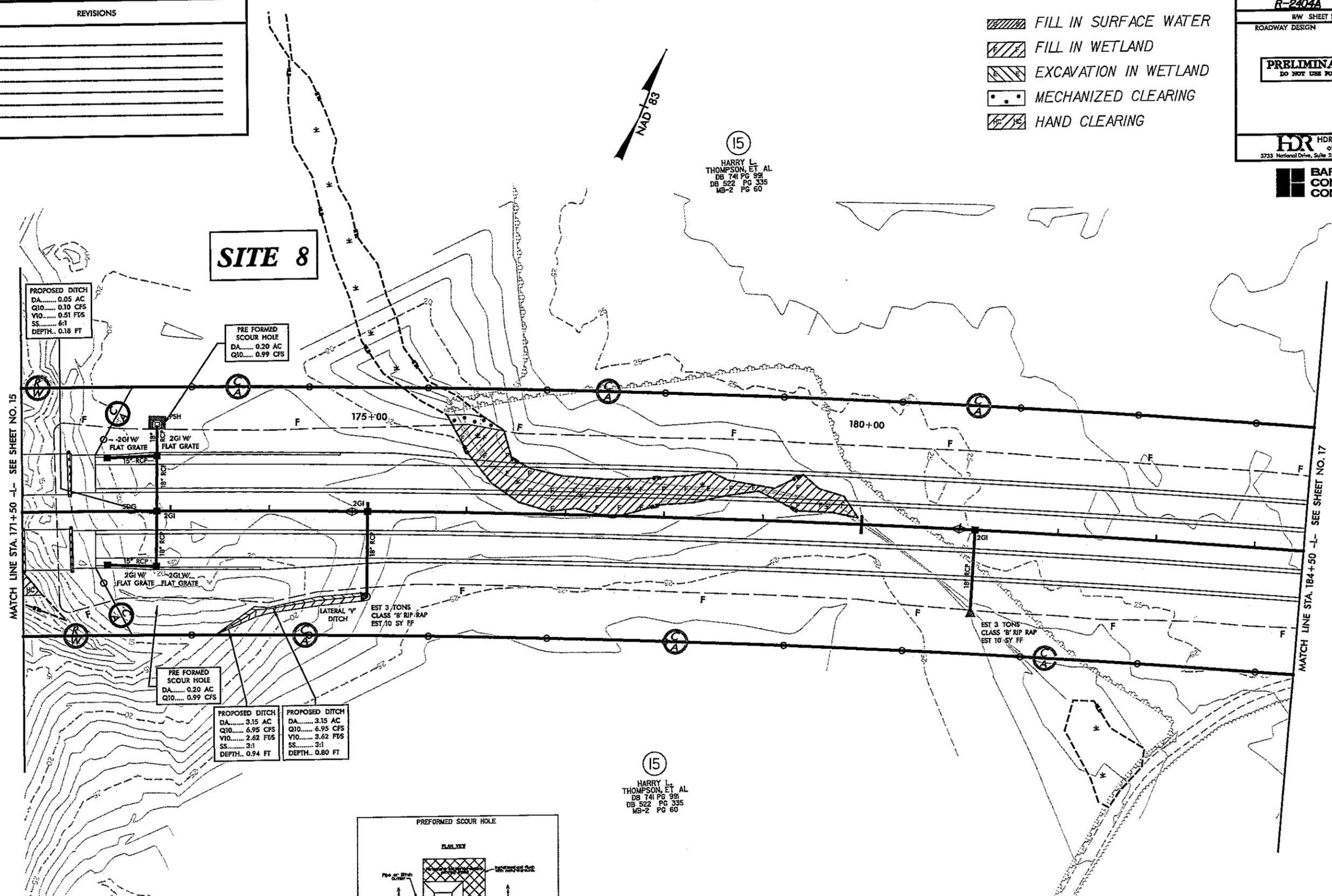
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300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING
- HAND CLEARING

REVISIONS



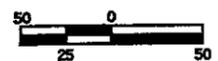
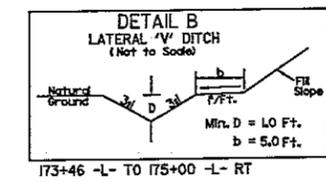
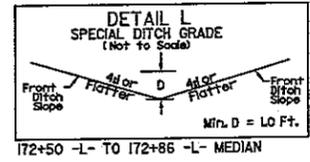
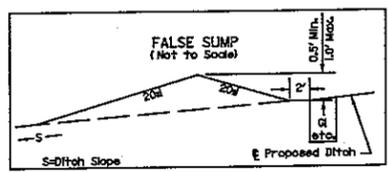
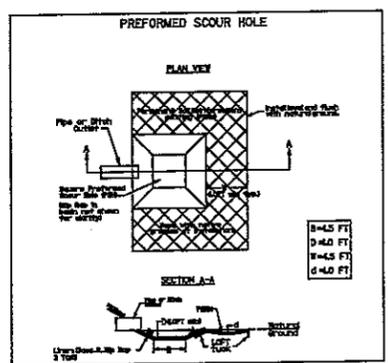
**PROPOSED DITCH**  
DA..... 0.05 AC  
Q10..... 0.10 CFS  
V10..... 0.51 FFS  
SS..... 6:1  
DEPTH.. 0.18 FT

**PRE FORMED SCOUR HOLE**  
DA..... 0.20 AC  
Q10..... 0.99 CFS

**PRE FORMED SCOUR HOLE**  
DA..... 0.20 AC  
Q10..... 0.99 CFS

**PROPOSED DITCH**  
DA..... 3.15 AC  
Q10..... 6.95 CFS  
V10..... 2.62 FFS  
SS..... 3:1  
DEPTH.. 0.94 FT

**PROPOSED DITCH**  
DA..... 3.15 AC  
Q10..... 6.95 CFS  
V10..... 3.62 FFS  
SS..... 3:1  
DEPTH.. 0.80 FT



**NOTES:** SEE SHEET NO. 60-61 FOR -L- PROFILE.  
SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.  
ALL CSP TO BE ROD AND LUG CONNECTED.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

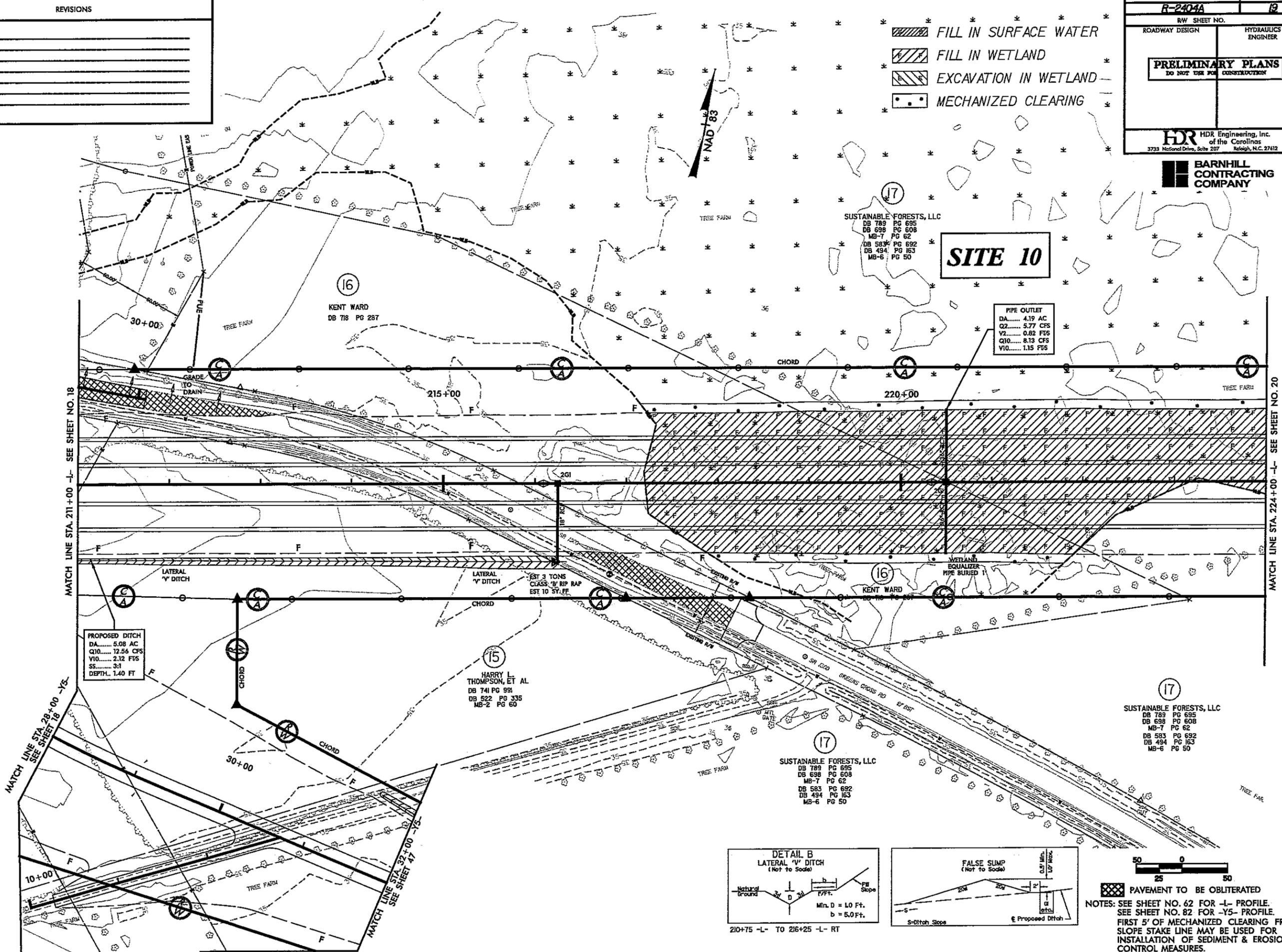
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REVISIONS


PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>19</b>
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	
<b>BARNHILL CONTRACTING COMPANY</b>	

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING

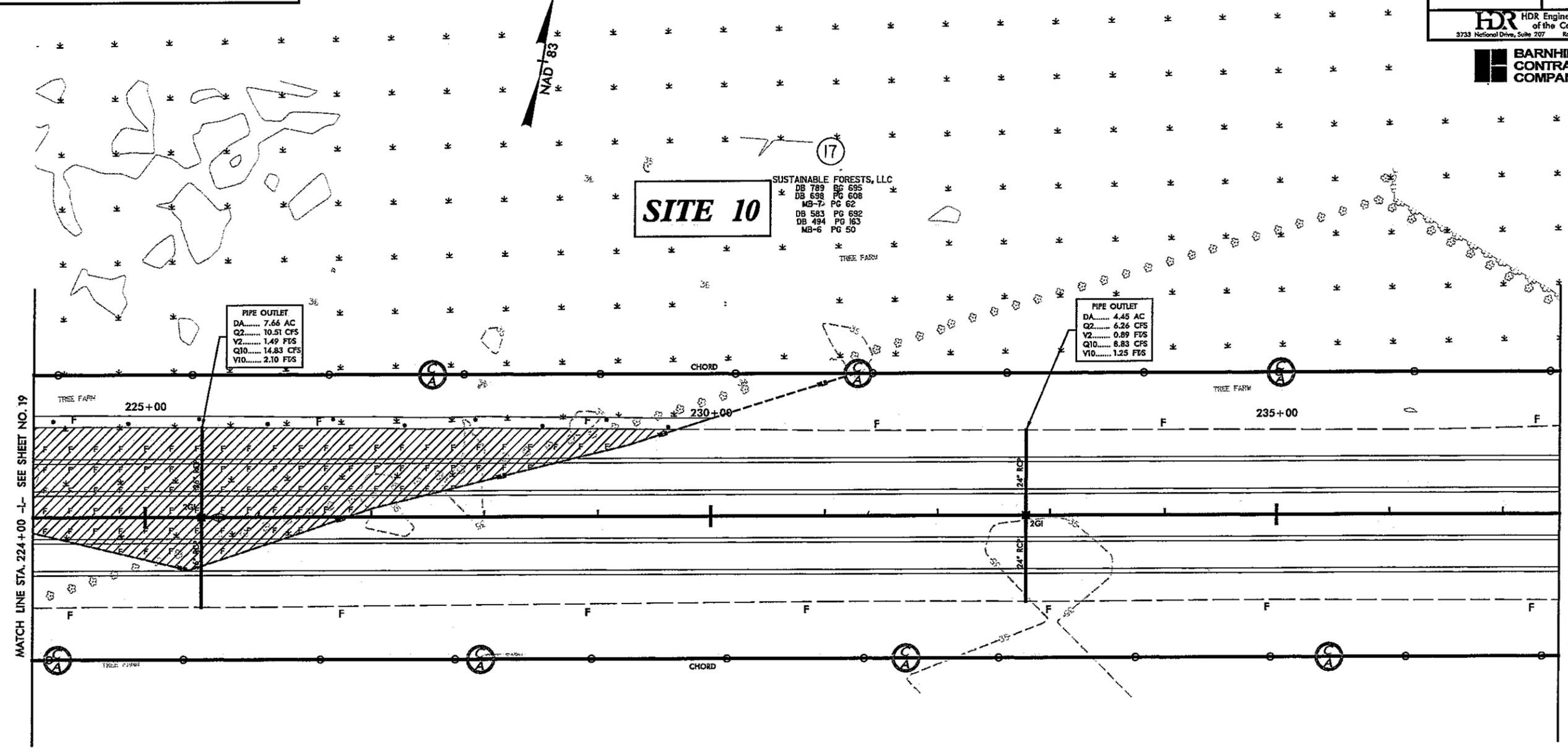


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PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>20</b>
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 8733 National Drive, Suite 207 Raleigh, N.C. 27612	
<b>BARNHILL CONTRACTING COMPANY</b>	

REVISIONS

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING



PIPE OUTLET  
 DA..... 7.66 AC  
 Q2..... 10.51 CFS  
 V2..... 1.49 FTS  
 Q10..... 14.83 CFS  
 V10..... 2.10 FTS

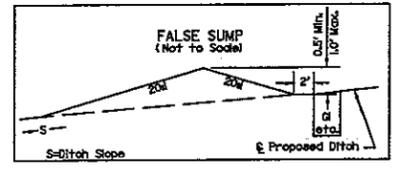
PIPE OUTLET  
 DA..... 4.45 AC  
 Q2..... 6.26 CFS  
 V2..... 0.89 FTS  
 Q10..... 8.83 CFS  
 V10..... 1.25 FTS

**SITE 10**

SUSTAINABLE FORESTS, LLC  
 DB 789 PG 695  
 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50

17

SUSTAINABLE FORESTS, LLC  
 DB 789 PG 695  
 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50



NOTE: FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

NOTES: SEE SHEET NO. 61-62 FOR -L- PROFILE.

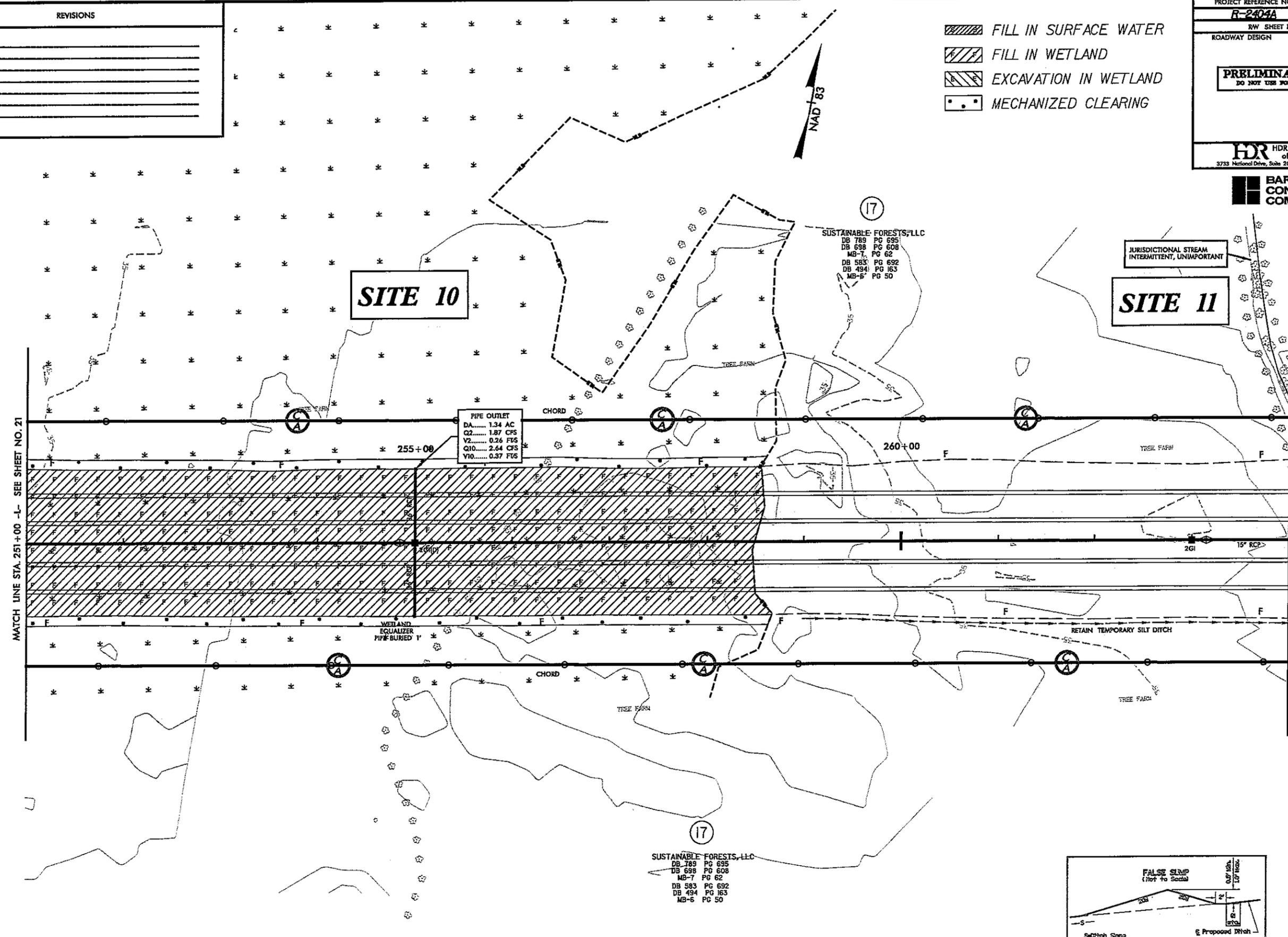
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PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>22</b>
RW SHEET NO. ROADWAY DESIGN	REVISIONS HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	
 <b>BARNHILL CONTRACTING COMPANY</b>	

REVISIONS

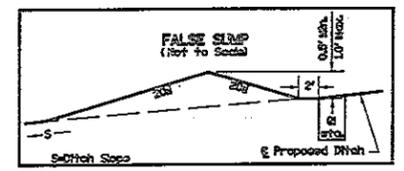
-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING



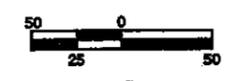
PIPE OUTLET  
 DA..... 1.34 AC  
 Q2..... 1.87 CFS  
 V2..... 0.26 FFS  
 Q10..... 2.64 CFS  
 Y10..... 0.37 FFS

(17)  
 SUSTAINABLE FORESTS, LLC  
 DB 789 PG 695  
 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50

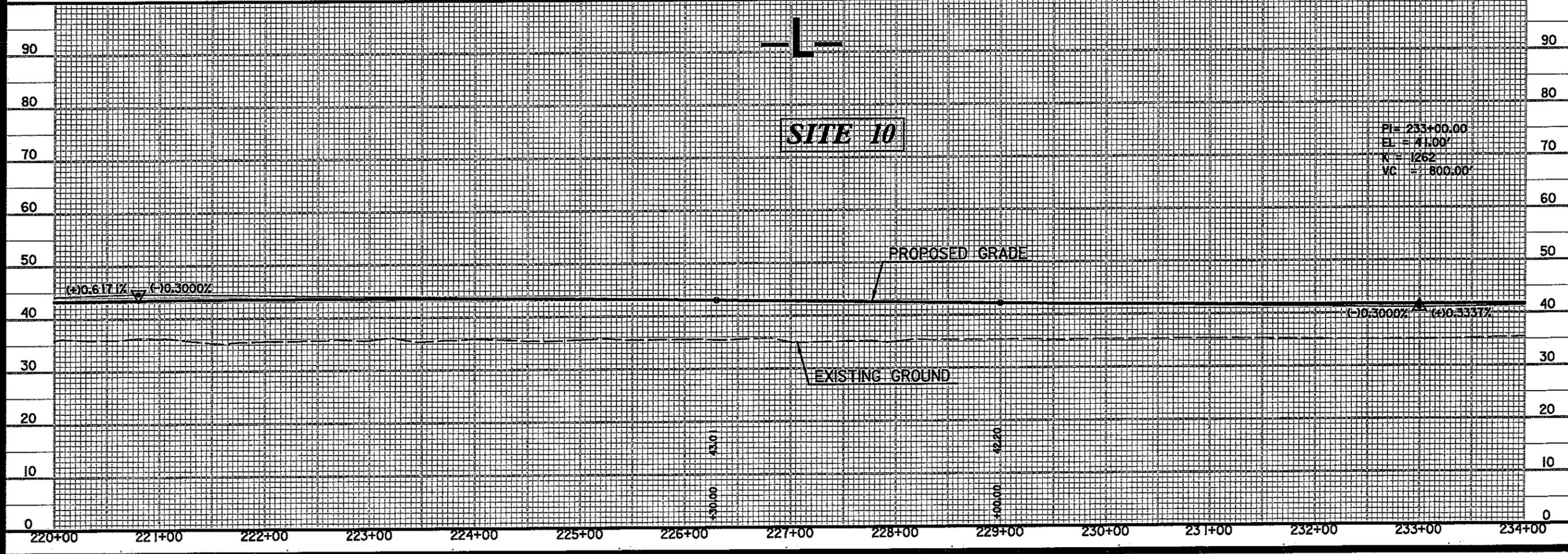
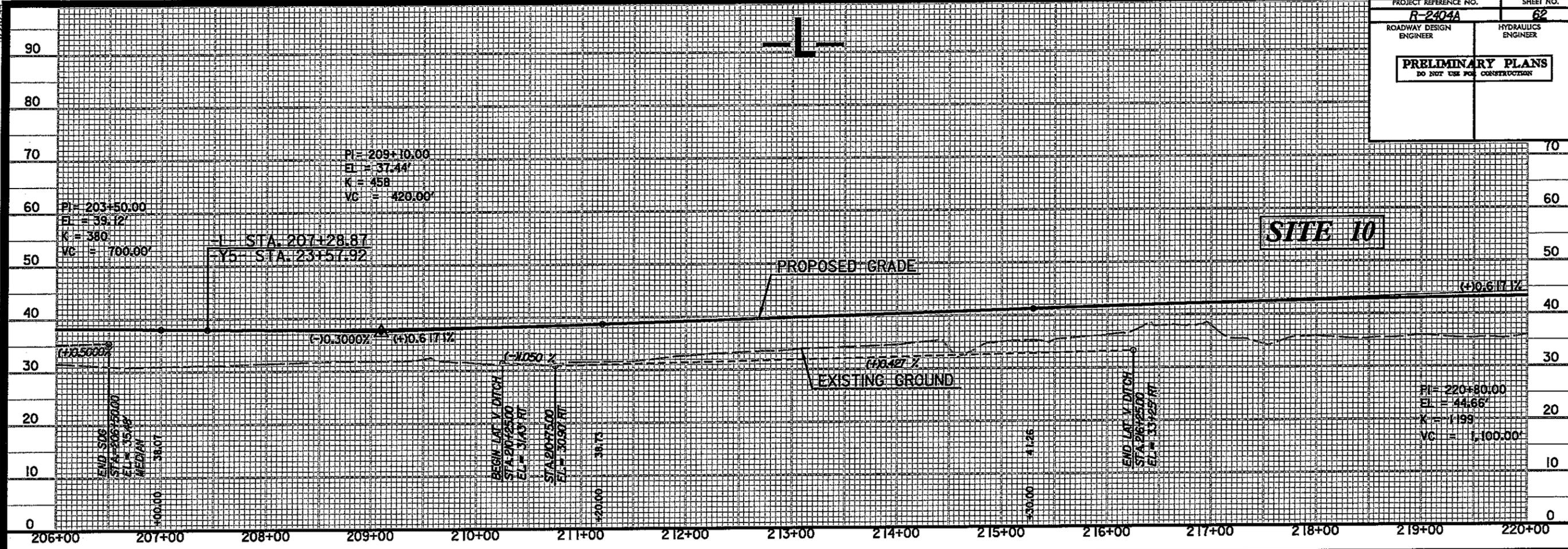
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 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50



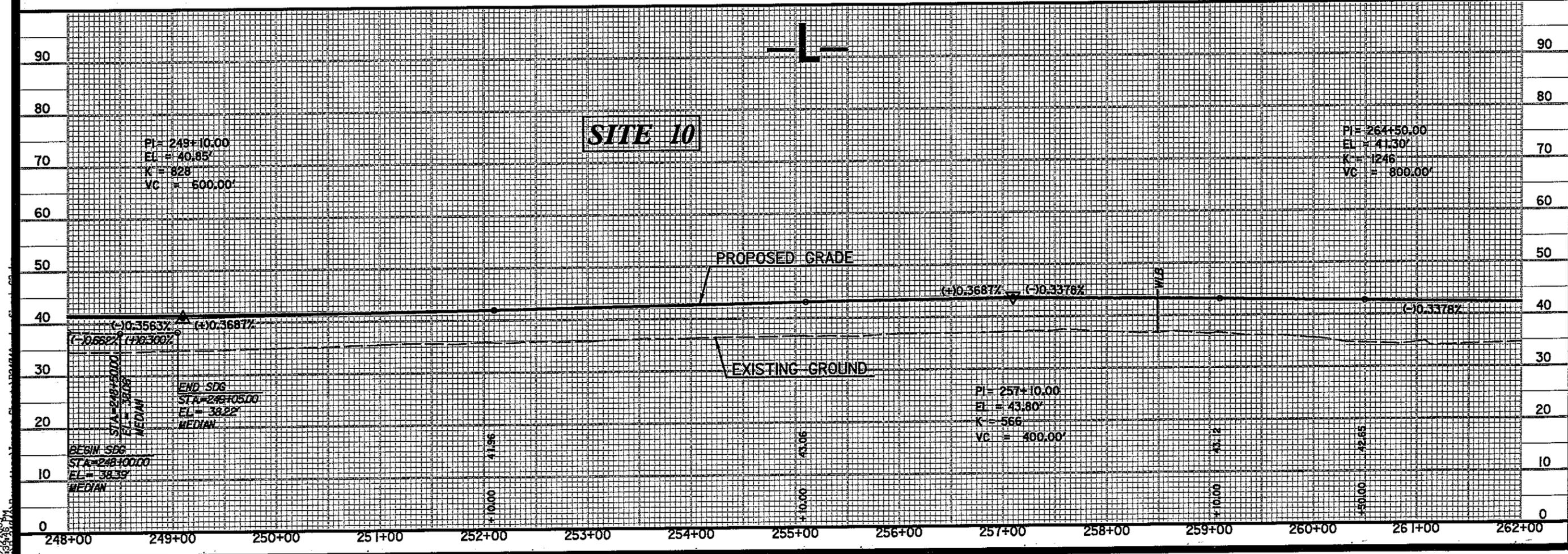
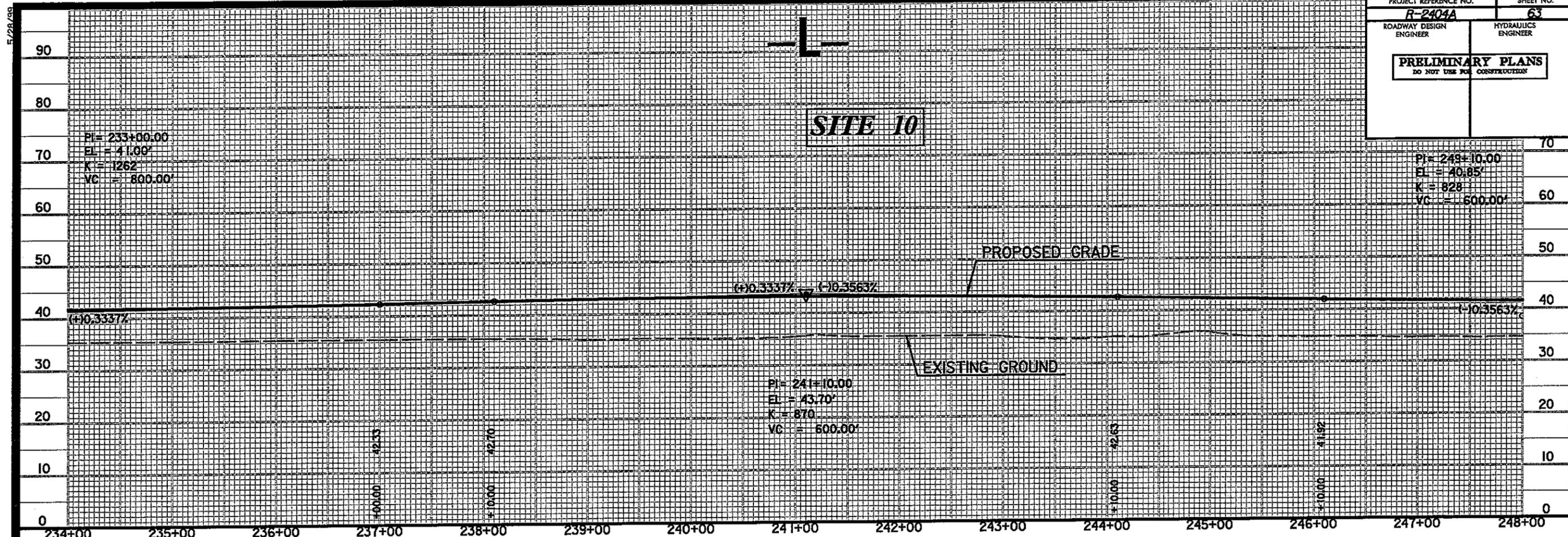
NOTES: SEE SHEET NO. 62-63 FOR -L- PROFILE  
 DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.  
 FIRST 5\' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.



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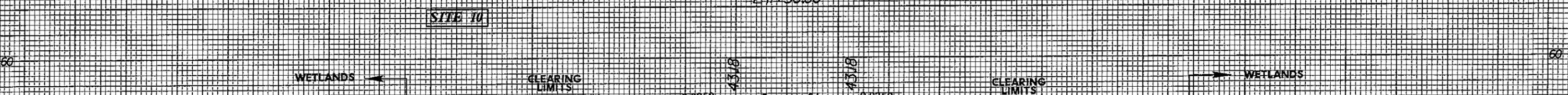
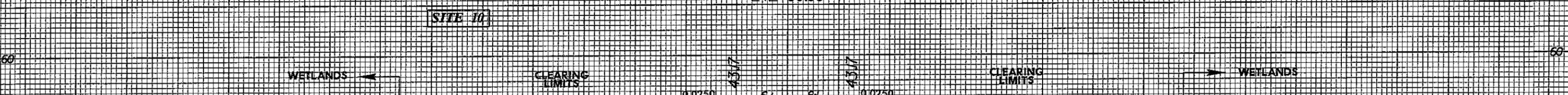
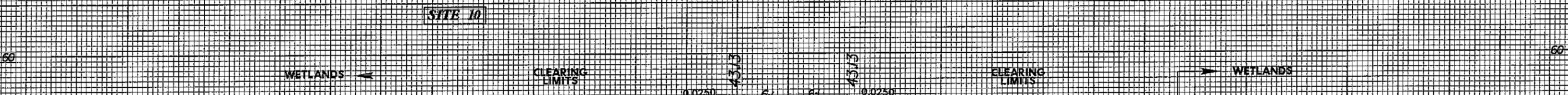
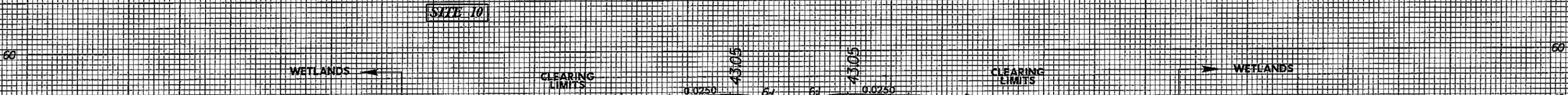
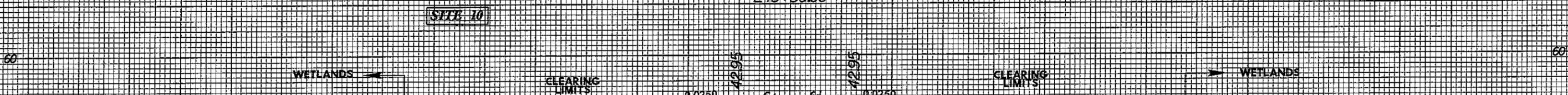
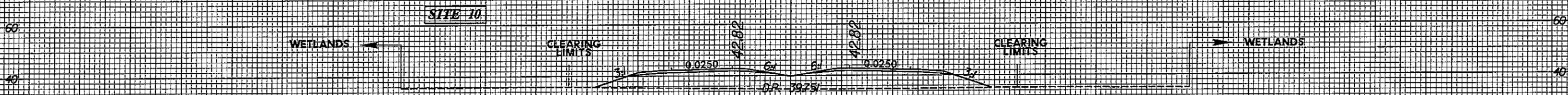
5/28/95  
2/1/95  
2/3/95

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-2404A	X-84

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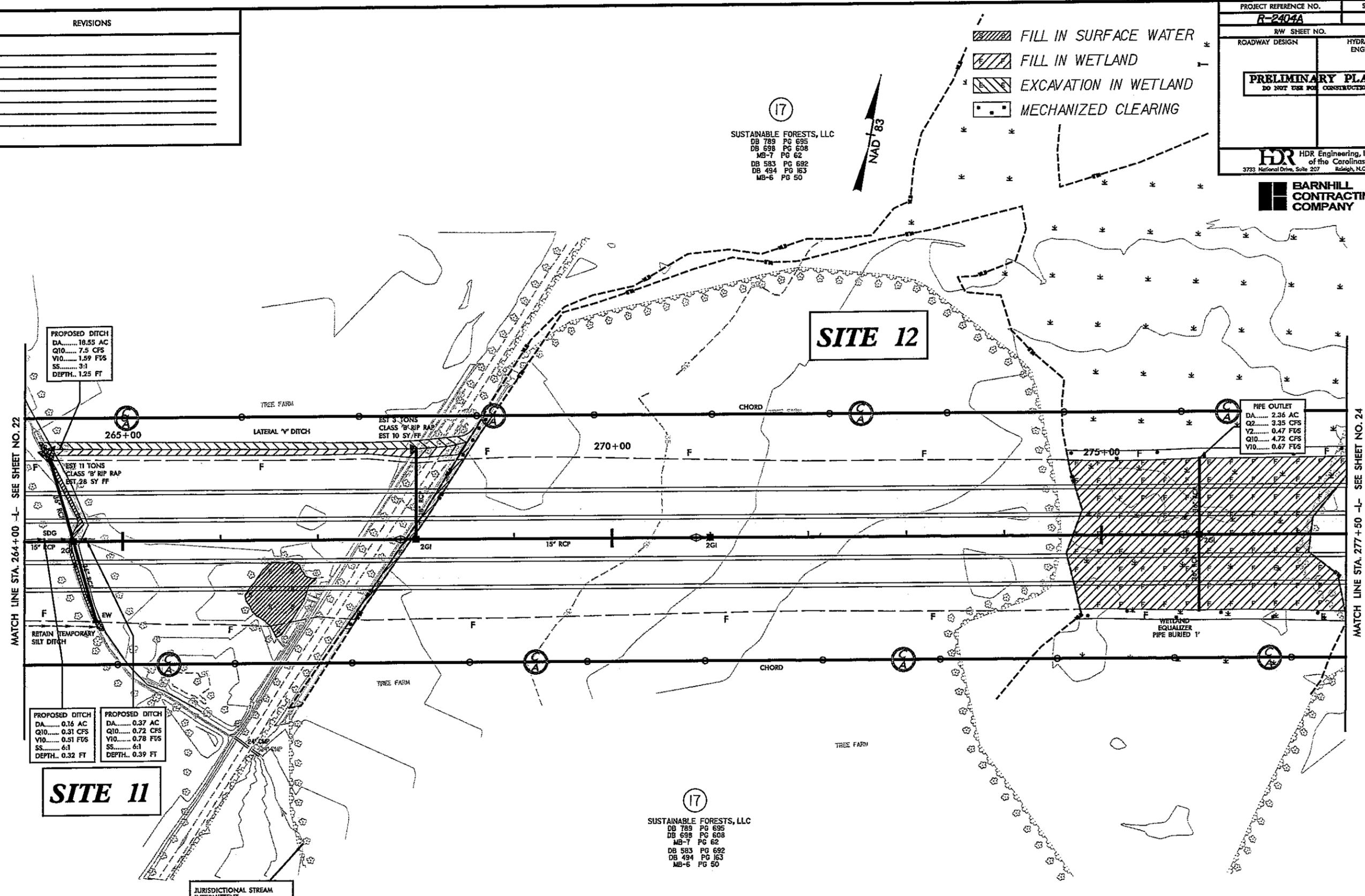
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PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>23</b>
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 3723 National Drive, Suite 207 Raleigh, N.C. 27612	
<b>BARNHILL CONTRACTING COMPANY</b>	

REVISIONS

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING

(17)  
SUSTAINABLE FORESTS, LLC  
DB 789 PG 695  
DB 698 PG 608  
MB-7 PG 62  
DB 583 PG 692  
DB 494 PG 163  
MB-6 PG 50



PROPOSED DITCH  
DA..... 18.55 AC  
Q10..... 7.5 CFS  
V10..... 1.59 FVS  
SS..... 3:1  
DEPTH.. 1.25 FT

PIPE OUTLET  
DA..... 2.36 AC  
Q2..... 3.35 CFS  
Y2..... 0.47 FVS  
Q10..... 4.72 CFS  
V10..... 0.67 FVS

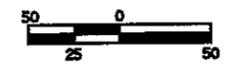
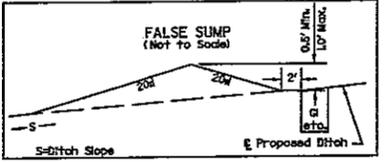
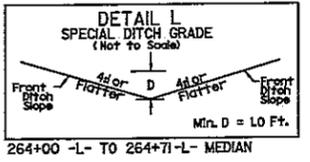
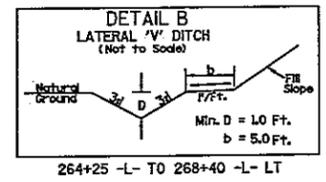
PROPOSED DITCH  
DA..... 0.16 AC  
Q10..... 0.31 CFS  
V10..... 0.51 FVS  
SS..... 6:1  
DEPTH.. 0.32 FT

PROPOSED DITCH  
DA..... 0.37 AC  
Q10..... 0.72 CFS  
V10..... 0.78 FVS  
SS..... 6:1  
DEPTH.. 0.39 FT

**SITE 11**

**SITE 12**

(17)  
SUSTAINABLE FORESTS, LLC  
DB 789 PG 695  
DB 698 PG 608  
MB-7 PG 62  
DB 583 PG 692  
DB 494 PG 163  
MB-6 PG 50



NOTES: SEE SHEET NO. 63 FOR -L- PROFILE.  
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

8/24/2005 12:28:39 PM C:\Users\jrh\Documents\Projects\2404A\2404A.dwg jrh\jrh\jrh.dwg

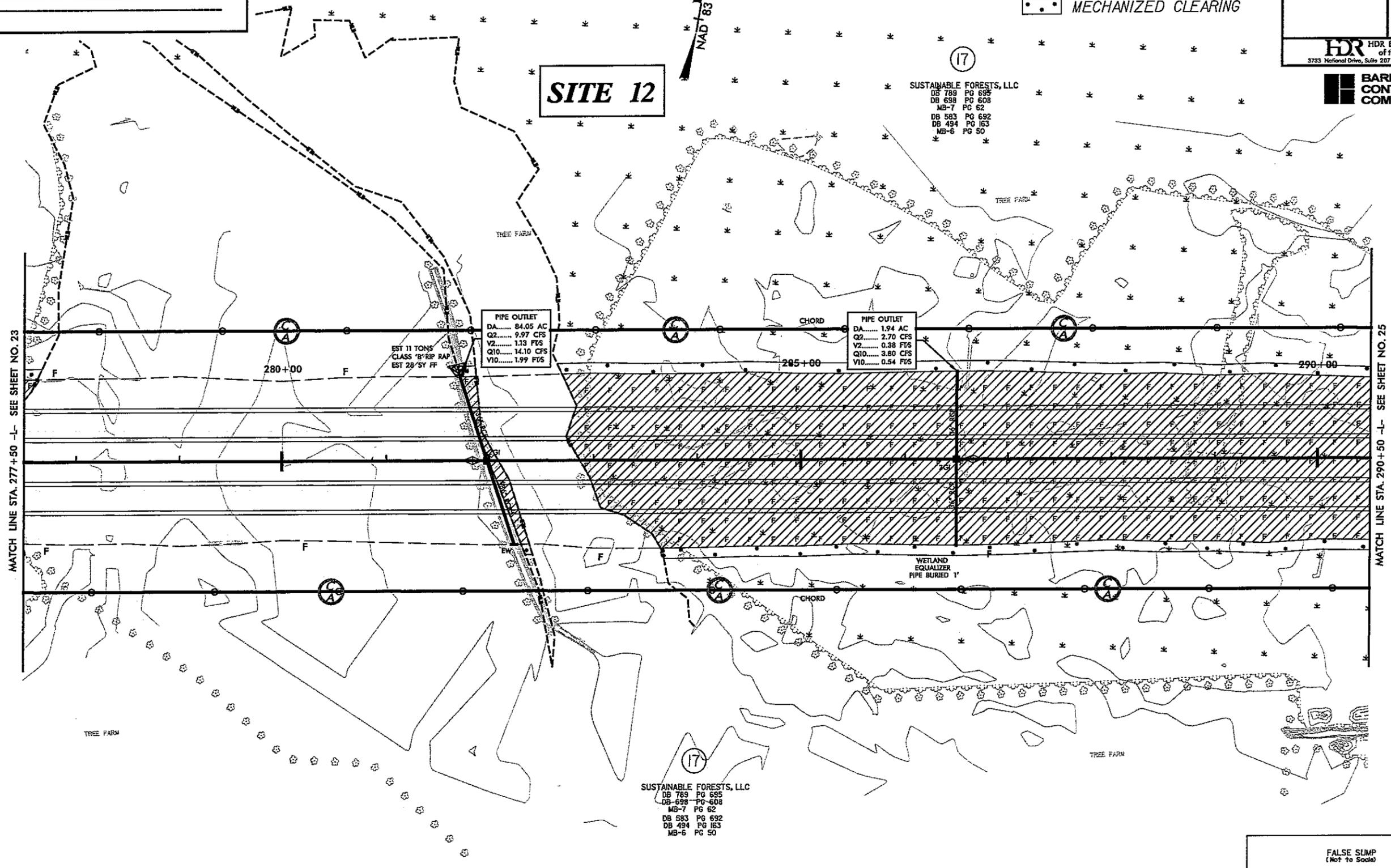
REVISIONS

-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING

# SITE 12

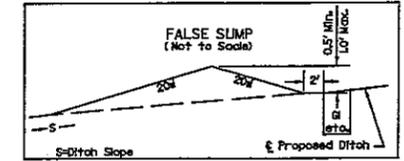
SUSTAINABLE FORESTS, LLC  
 DB 789 PG 685  
 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50

SUSTAINABLE FORESTS, LLC  
 DB 783 PG 685  
 DB 698 PG 608  
 MB-7 PG 62  
 DB 583 PG 692  
 DB 494 PG 163  
 MB-6 PG 50



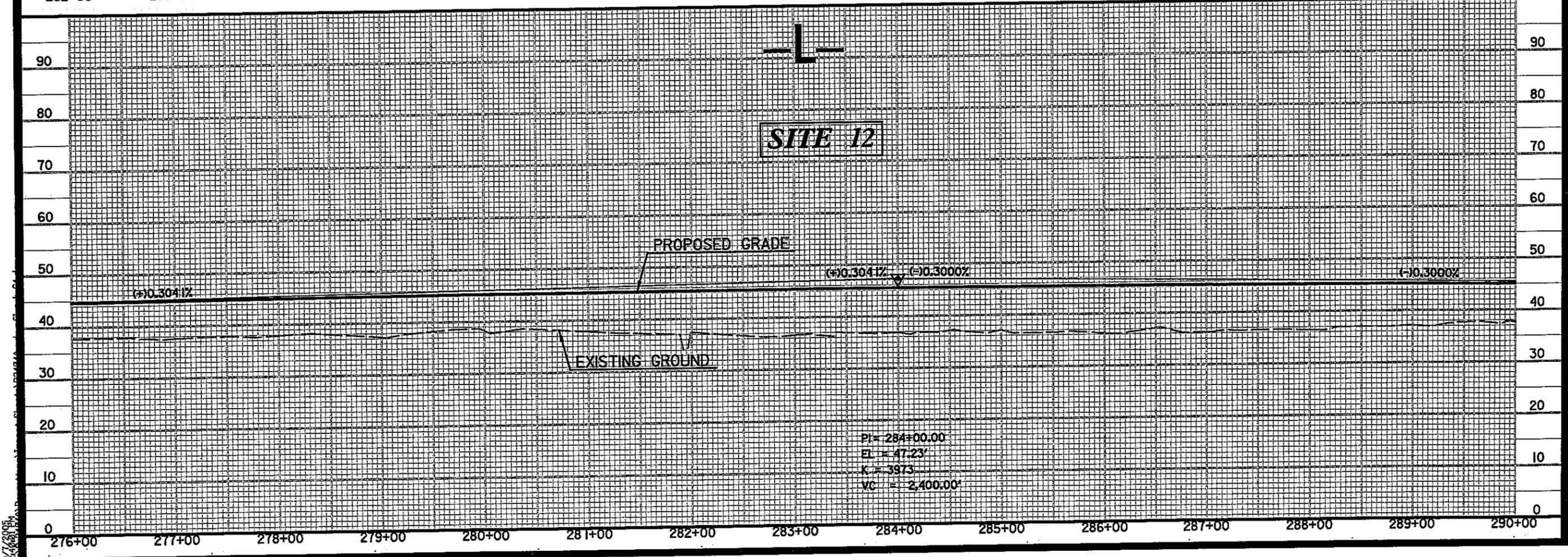
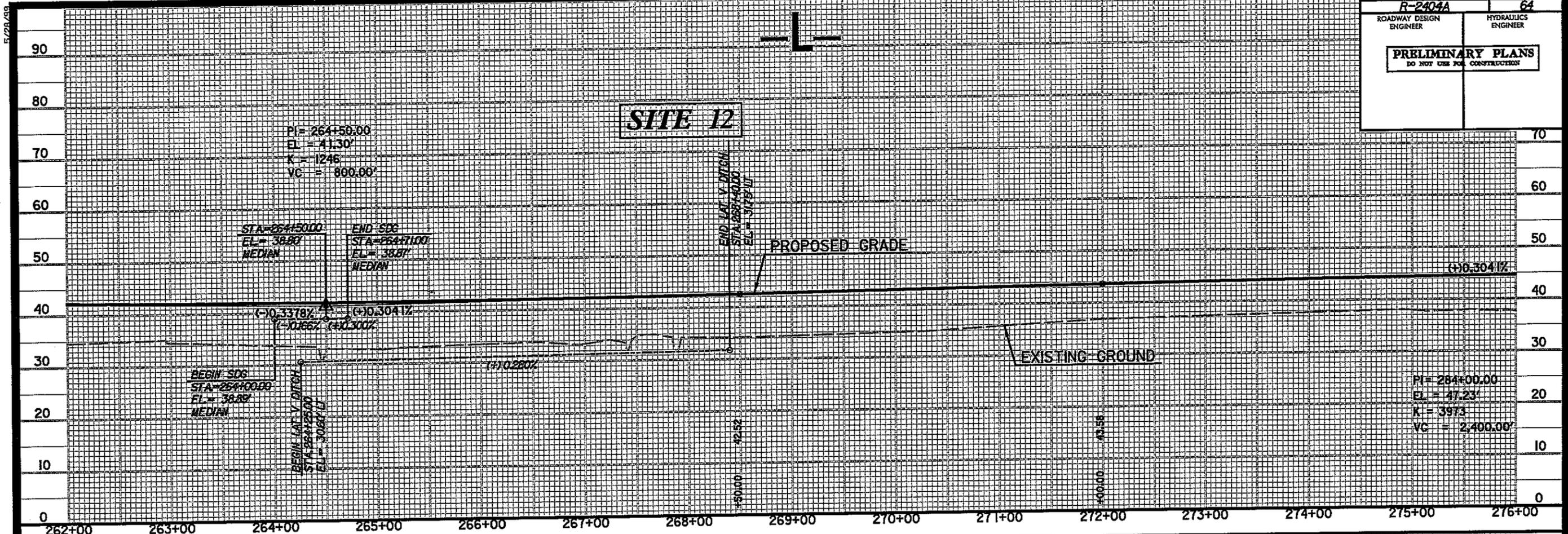
MATCH LINE STA. 277+50 -L- SEE SHEET NO. 23

MATCH LINE STA. 290+50 -L- SEE SHEET NO. 25



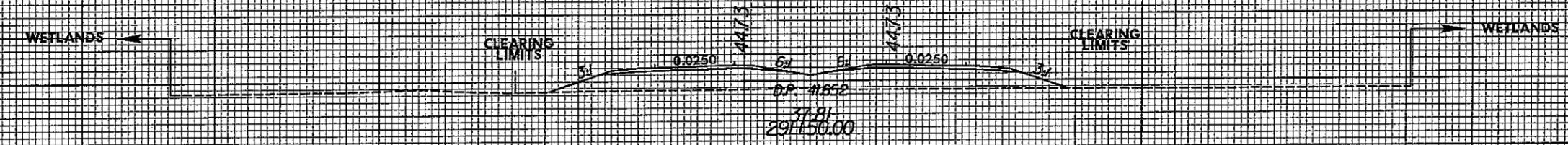
NOTES: SEE SHEET NO. 63-64 FOR -L- PROFILE  
 FIRST 5' OF MECHANIZED CLEARING FROM SLOPE  
 STAKE LINE MAY BE USED FOR INSTALLATION  
 OF SEDIMENT & EROSION CONTROL MEASURES.



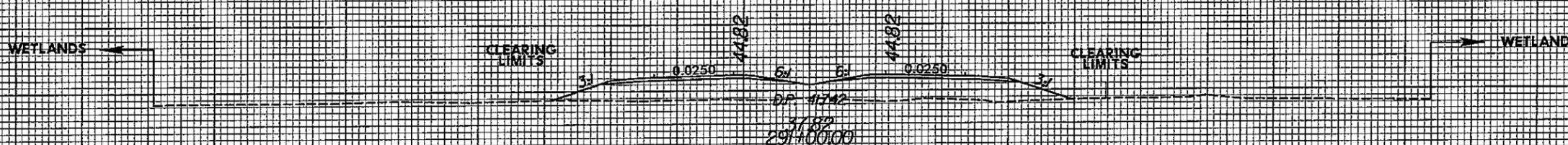


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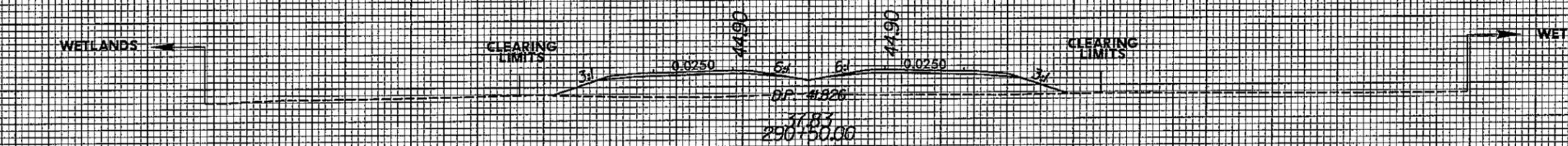
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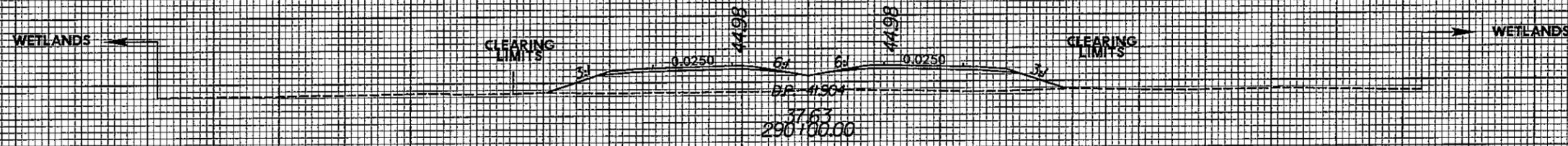
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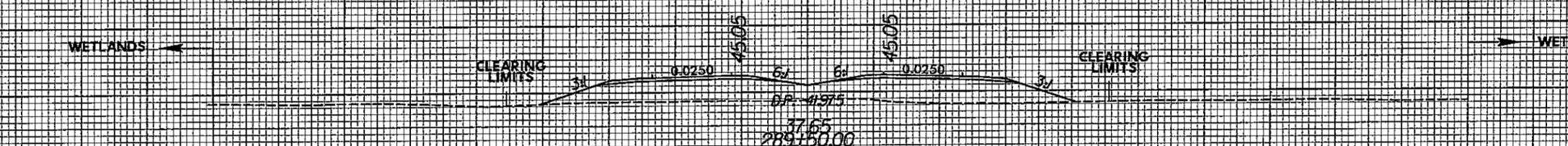
SITE 12



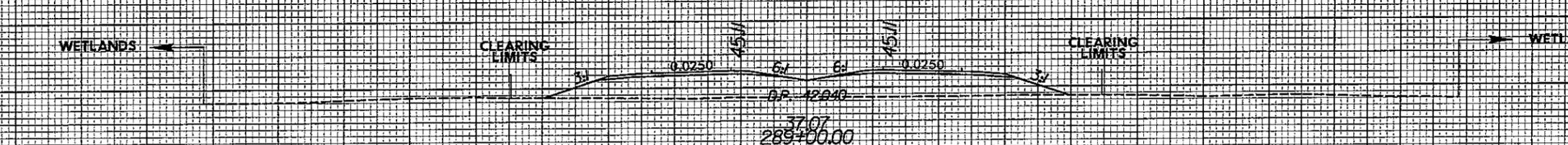
SITE 12



SITE 12



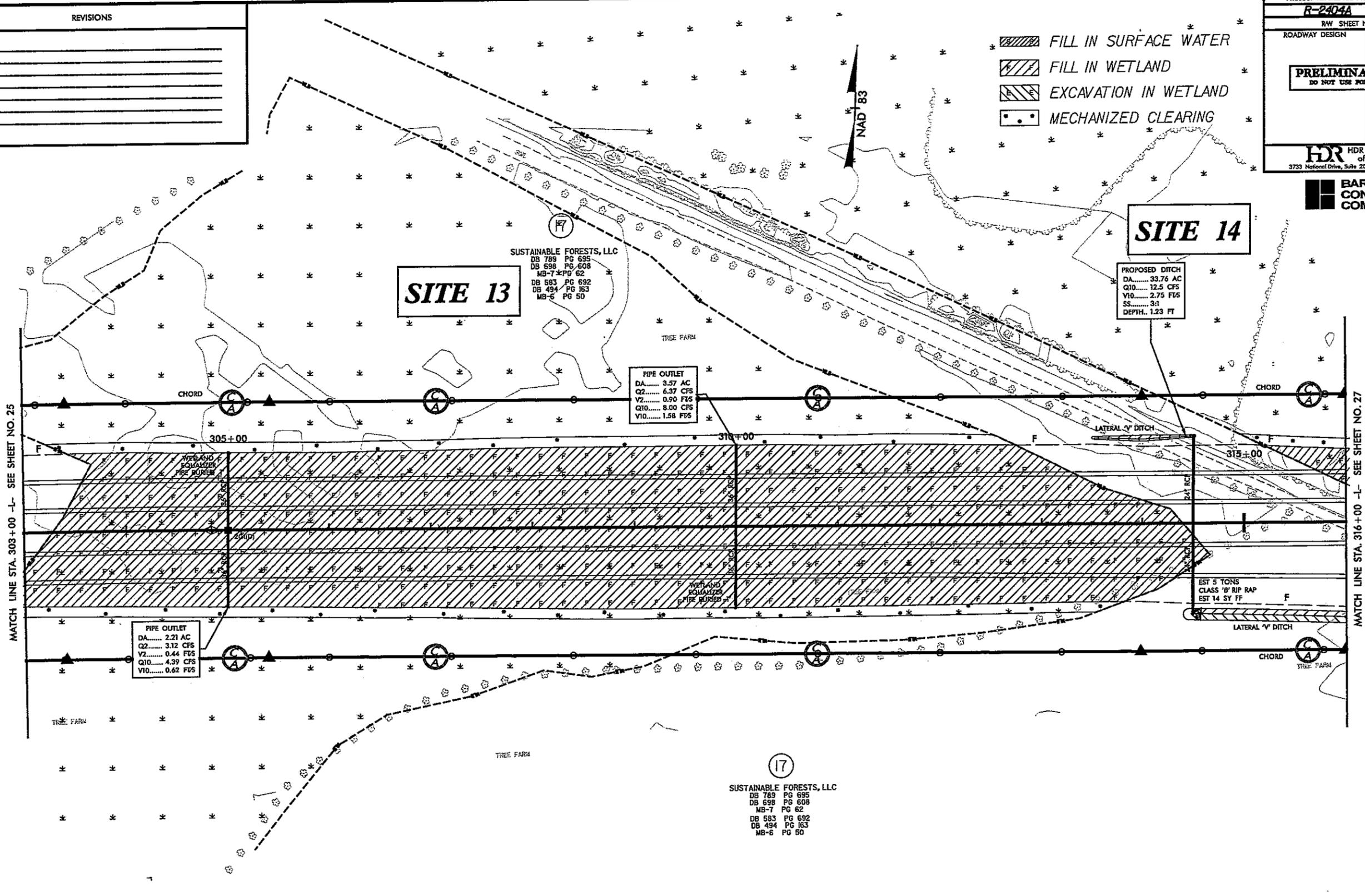
SITE 12



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REVISIONS

-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING



**SITE 13**

SUSTAINABLE FORESTS, LLC  
DB 789 PG 695  
DB 698 PG 608  
MB-7 PG 62  
DB 583 PG 692  
DB 494 PG 163  
MB-6 PG 50

**SITE 14**

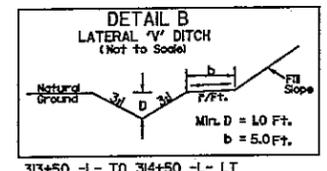
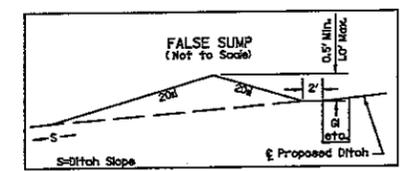
PROPOSED DITCH  
DA..... 33.76 AC  
Q2..... 12.5 CFS  
V10..... 2.75 FTS  
SS..... 3:1  
DEPTH.. 1.23 FT

PIPE OUTLET  
DA..... 3.57 AC  
Q2..... 6.37 CFS  
V2..... 0.90 FTS  
Q10..... 8.00 CFS  
V10..... 1.58 FTS

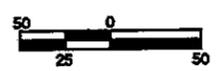
PIPE OUTLET  
DA..... 2.21 AC  
Q2..... 3.12 CFS  
V2..... 0.44 FTS  
Q10..... 4.39 CFS  
V10..... 0.62 FTS

**SITE 17**

SUSTAINABLE FORESTS, LLC  
DB 789 PG 695  
DB 698 PG 608  
MB-7 PG 62  
DB 583 PG 692  
DB 494 PG 163  
MB-6 PG 50



313+50 -L- TO 314+50 -L- LT  
314+50 -L- TO 316+50 -L- RT



NOTES: SEE SHEET NO. 65 FOR -L- PROFILE.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

**SITE 13**

**SITE 12**

PI = 300+10.00  
 EL = 42.40'  
 K = 1236  
 VC = 820.00'

PI = 284+00.00  
 EL = 47.23'  
 K = 3973  
 VC = 2,400.00'

PROPOSED GRADE

EXISTING GROUND

END SDG  
 STA 301+50.00  
 EL = 40.09'  
 MEDIAN

(-)-0.3000% (+)-0.3636% (+)-0.3000% (+)-10.50%

BEGIN LAT. BASE DITCH  
 STA 295+00.00  
 EL = 32.50 FT

END LAT. BASE DITCH  
 STA 297+00.00  
 EL = 32.50 FT

BEGIN SDG  
 STA 299+70.00  
 EL = 39.98'  
 MEDIAN

BEGIN SDG  
 STA 301+00.00  
 EL = 39.57'  
 MEDIAN

290+00 291+00 292+00 293+00 294+00 295+00 296+00 297+00 298+00 299+00 300+00 301+00 302+00 303+00 304+00

**PLAN SUMMARY DATA**  
 30+00 - L

DRAINAGE AREA	357 AC
DESIGN FREQUENCY	50 YR
DESIGN DISCHARGE	1100 CFS
DESIGN HW. ELEVATION	38.66 FT
Q100 DISCHARGE	1100 CFS
Q100 HW. ELEVATION	38.66 FT
OVERTOPPING FREQUENCY	500+ YR
OVERTOPPING DISCHARGE	90 CFS
OVERTOPPING ELEVATION	45.50 FT

**PLAN SUMMARY DATA**  
 314+50 - L

DRAINAGE AREA	3376 AC
DESIGN FREQUENCY	50 YR
DESIGN DISCHARGE	110 CFS
DESIGN HW. ELEVATION	37.82 FT
Q100 DISCHARGE	130 CFS
Q100 HW. ELEVATION	38.06 FT
OVERTOPPING FREQUENCY	500+ YR
OVERTOPPING DISCHARGE	35 CFS
OVERTOPPING ELEVATION	43.74 FT

PI = 316+20.00  
 EL = 42.89'  
 K = 324  
 VC = 260.00'

**SITE 13**

**SITE 14**

PROPOSED GRADE

EXISTING GROUND

36" RCP  
 STA 310+00.00  
 INV. IN = 36.60  
 INV. OUT = 36.57

PI = 310+00.00  
 EL = 46.00'  
 K = 532  
 VC = 460.00'

BEGIN LAT. V. DITCH  
 STA 314+50.00  
 EL = 35.84 FT

BEGIN LAT. V. DITCH  
 STA 313+50.00  
 EL = 36.70 FT

24" RCP  
 STA 314+50.00  
 INV. IN = 35.84  
 INV. OUT = 35.40

(+)-0.3636% (+)-0.3636% (-)-0.5016% (-)-0.5016% (+)-0.3000%

304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00 314+00 315+00 316+00 317+00 318+00

5/28/99 2:17:00 PM

8/23/99

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 15.51 6' 6' 0.0250 15.51

DP-42440

37.61

309+50.00

CLEARING LIMITS

WLB

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 15.48 6' 6' 0.0250 15.48

DP-42404

37.77

309+00.00

CLEARING LIMITS

WLB

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 15.39 6' 6' 0.0250 15.39

DP-42321

37.70

308+50.00

CLEARING LIMITS

WLB

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 15.26 6' 6' 0.0250 15.26

DP-42191

37.71

308+00.00

CLEARING LIMITS

WLB

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 15.09 6' 6' 0.0250 15.09

DP-42018

37.65

307+50.00

CLEARING LIMITS

WLB

SITE 13

WETLANDS

CLEARING LIMITS

0.0250 14.91 6' 6' 0.0250 14.91

DP-41836

37.68

307+00.00

CLEARING LIMITS

WETLANDS

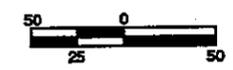
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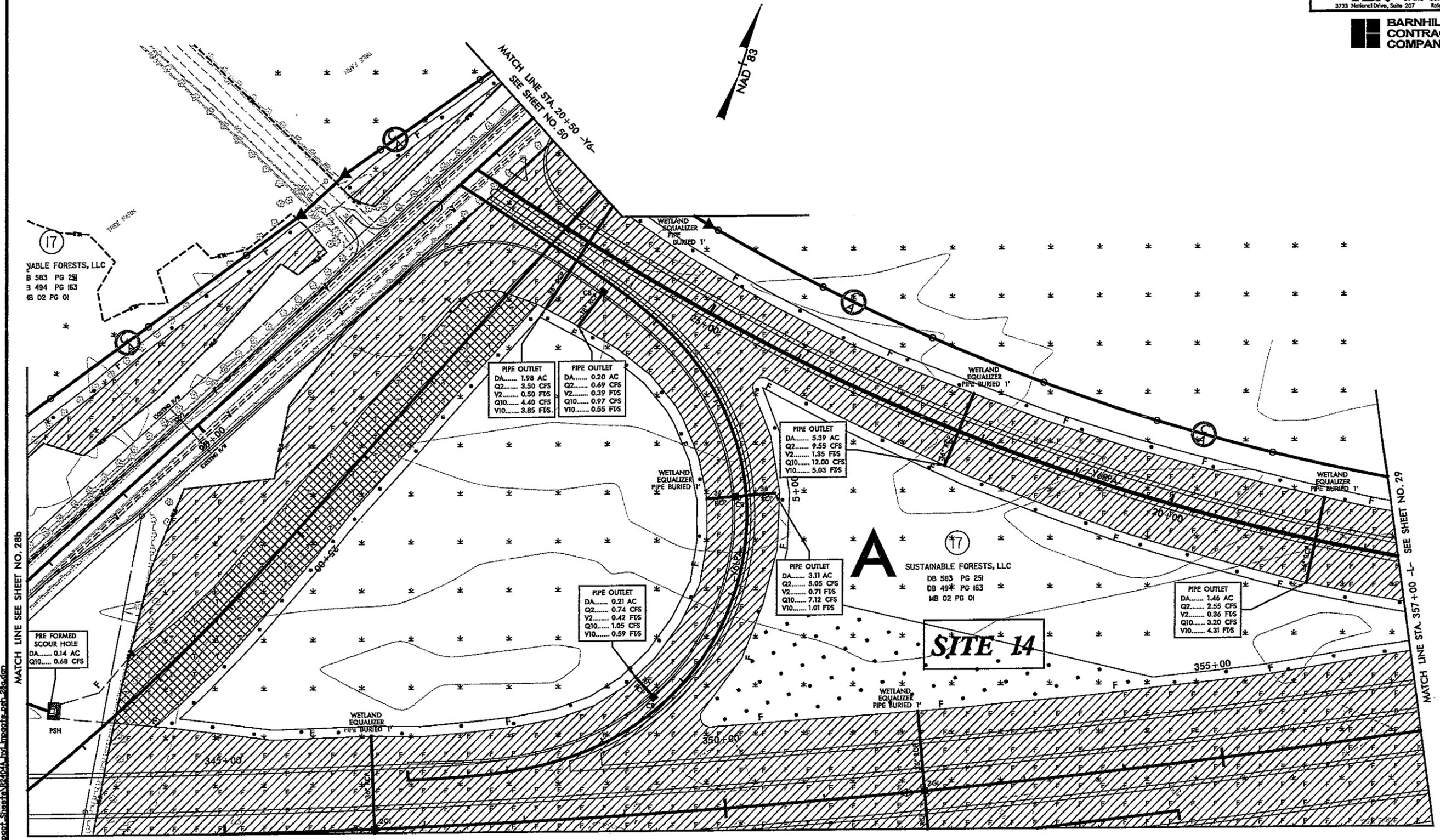


**BARNHILL CONTRACTING COMPANY**

NOTES: SEE SHEETS NO. 66-67 FOR -L- PROFILE.  
SEE SHEET NO. 84 FOR -Y6- PROFILE.  
SEE SHEET NO. 86 FOR -Y6RPA- PROFILE.  
SEE SHEET NO. 87 FOR -Y6RPC- PROFILE.  
SEE SHEET NO. 88 FOR -Y6RPD- PROFILE.  
SEE SHEET NO. 89 FOR -Y6LPA- PROFILE.  
SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.  
ALL CSP TO BE ROD AND LUG CONNECTED.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE  
STAKE LINE MAY BE USED FOR INSTALLATION  
OF SEDIMENT & EROSION CONTROL MEASURES.



-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING
-  TEMPORARY FILL IN WETLAND



PIPE OUTLET		PIPE OUTLET	
DA.....	1.98 AC	DA.....	0.20 AC
Q2.....	3.50 CFS	Q2.....	0.69 CFS
V2.....	0.50 FFS	V2.....	0.39 FFS
Q10.....	4.40 CFS	Q10.....	0.97 CFS
V10.....	3.85 FFS	V10.....	0.55 FFS

PIPE OUTLET	
DA.....	5.39 AC
Q2.....	9.55 CFS
V2.....	1.35 FFS
Q10.....	12.00 CFS
V10.....	5.03 FFS

PIPE OUTLET	
DA.....	0.21 AC
Q2.....	0.74 CFS
V2.....	0.42 FFS
Q10.....	1.05 CFS
V10.....	0.59 FFS

PIPE OUTLET	
DA.....	3.11 AC
Q2.....	5.05 CFS
V2.....	0.71 FFS
Q10.....	7.12 CFS
V10.....	1.01 FFS

PIPE OUTLET	
DA.....	1.46 AC
Q2.....	2.55 CFS
V2.....	0.36 FFS
Q10.....	3.20 CFS
V10.....	4.31 FFS

VABLE FORESTS, LLC  
B 583 PG 251  
3 494 PG 163  
MB 02 PG 01

**A** SUSTAINABLE FORESTS, LLC  
DB 583 PG 251  
DB 494 PG 163  
MB 02 PG 01

**SITE 14**

MATCH LINE SEE SHEET NO. 28b

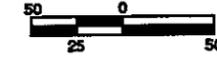
MATCH LINE STA. 357+00 -L- SEE SHEET NO. 29

MATCH LINE SEE SHEET NO. 28d

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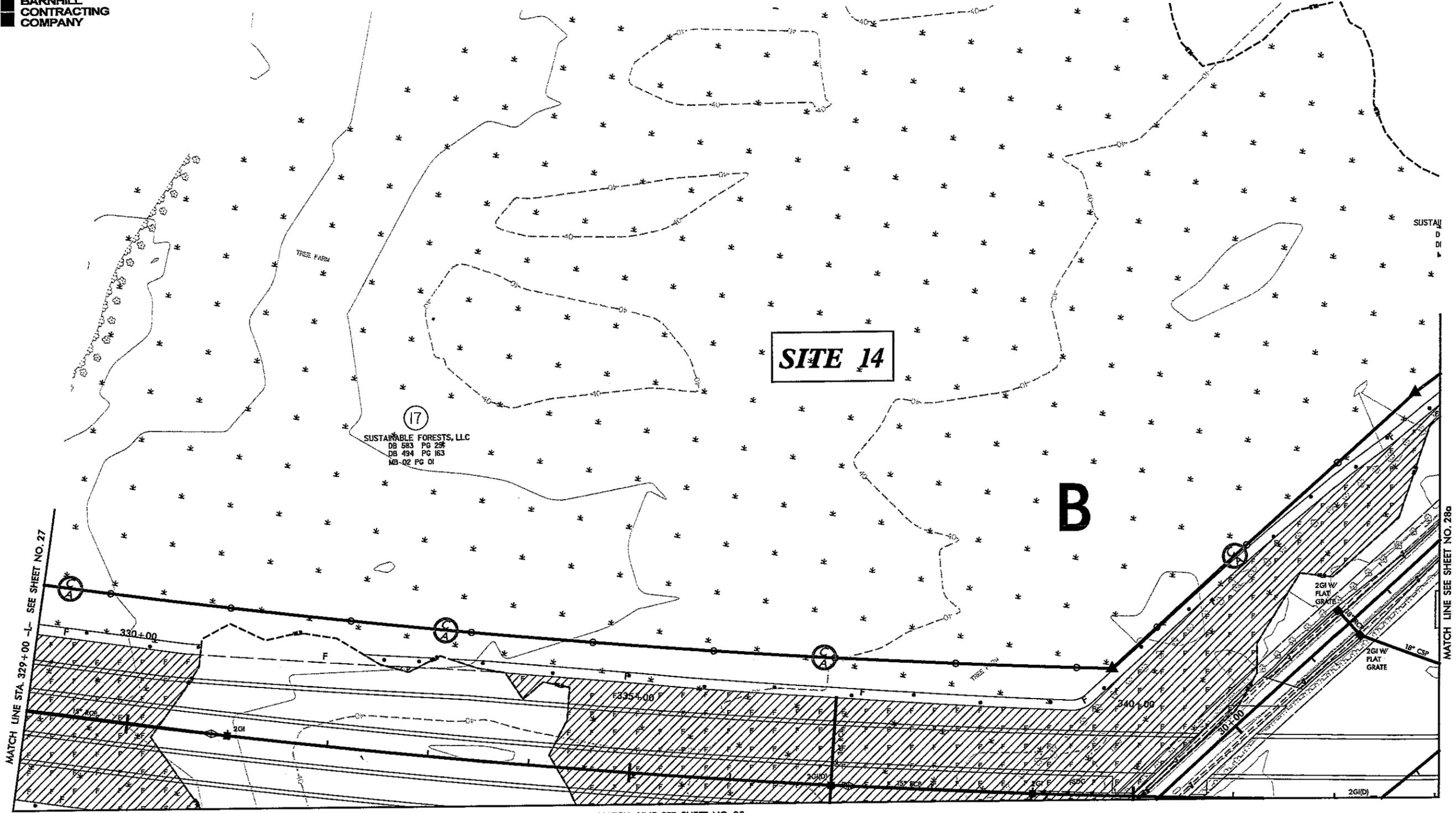
PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>28b</b>
R/W SHEET NO. ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING
- TEMPORARY FILL IN WETLAND



NOTES: SEE SHEETS NO. 66-67 FOR -L- PROFILE.  
SEE SHEET NO. 84 FOR -Y6- PROFILE.  
SEE SHEET NO. 86 FOR -Y6RPA- PROFILE.  
SEE SHEET NO. 87 FOR -Y6RPC- PROFILE.  
SEE SHEET NO. 88 FOR -Y6RPD- PROFILE.  
SEE SHEET NO. 89 FOR -Y6LPA- PROFILE.  
SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.  
ALL CSP TO BE ROD AND LUG CONNECTED.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

**BARNHILL CONTRACTING COMPANY**



(17)  
SUSTAINABLE FORESTS, LLC  
DB 583 PG 28  
DB 494 PG 163  
MB-02 PG 01

**SITE 14**

**B**

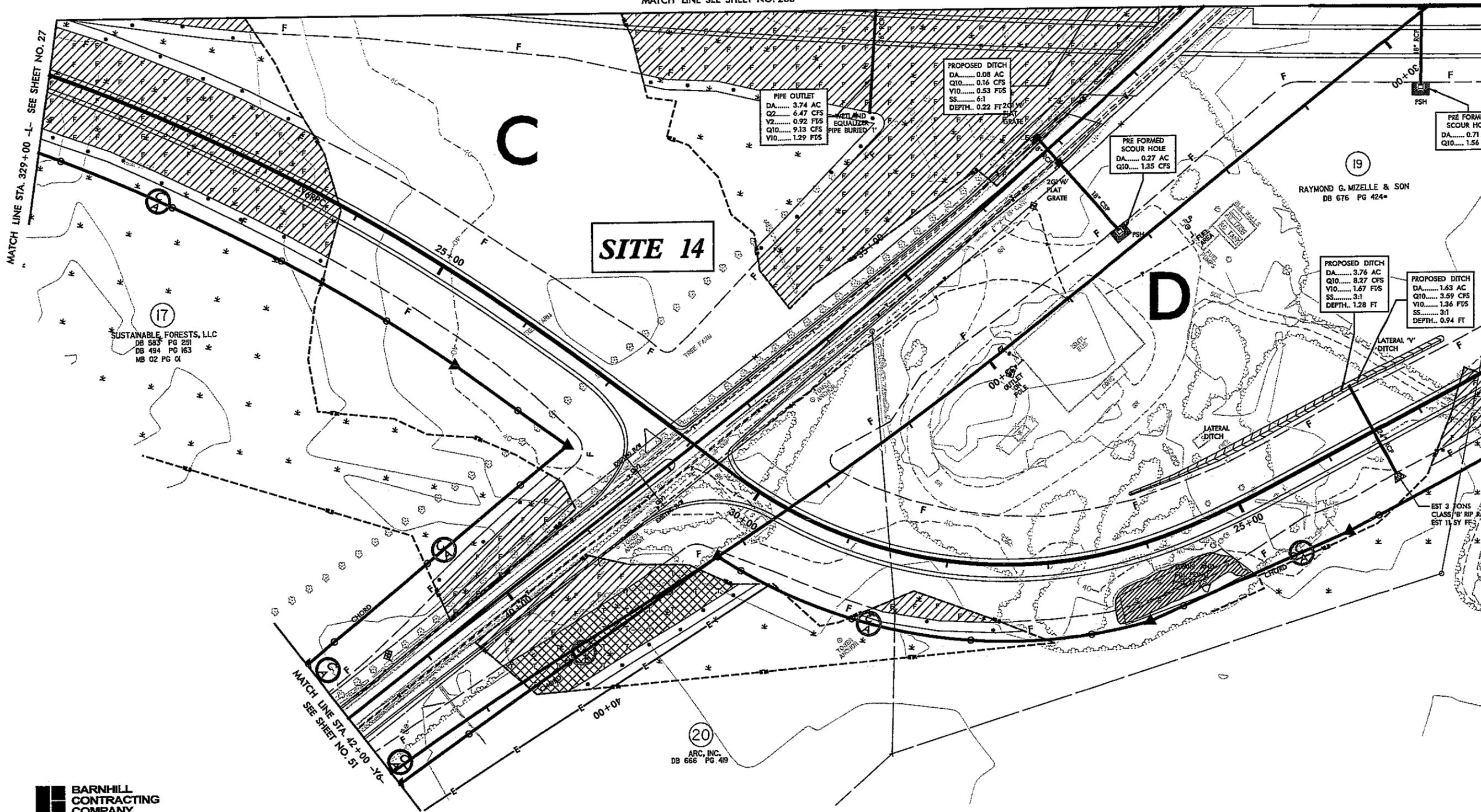
MATCH LINE STA. 329+00 -L- SEE SHEET NO. 27

MATCH LINE SEE SHEET NO. 28c

MATCH LINE SEE SHEET NO. 28c

R-2404A.dwg 1/24/2008 10:40 AM C:\Users\jmc\Documents\Projects\R-2404A\Drawings\28b.dwg

MATCH LINE SEE SHEET NO. 28b



MATCH LINE STA. 329+00 -L- SEE SHEET NO. 27

MATCH LINE SEE SHEET NO. 28b

**SITE 14**

17  
SUSTAINABLE FORESTS, LLC  
DB 583 PG 291  
DB 494 PG 163  
MB 02 PG 01

19  
RAYMOND G. MIZELLE & SON  
DB 676 PG 424\*

20  
ARC, INC.  
DB 666 PG 419

**BARNHILL CONTRACTING COMPANY**

PROJECT REFERENCE NO. **R-2404A** SHEET NO. **28c**

R/W SHEET NO. ROADWAY DESIGN HYDRAULICS ENGINEER

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING
- TEMPORARY FILL IN WETLAND

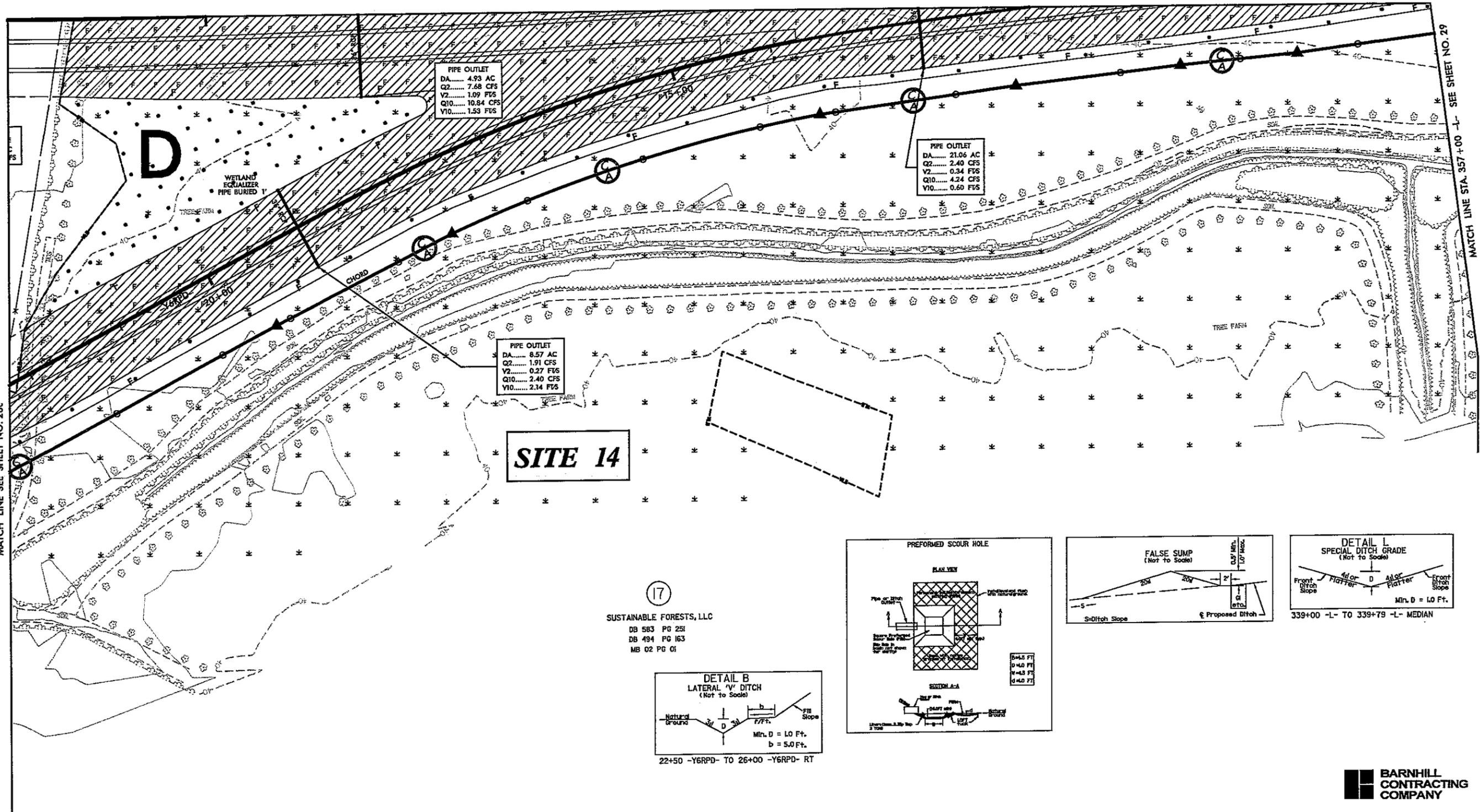


NOTES: SEE SHEETS NO. 66-67 FOR -L- PROFILE.  
SEE SHEET NO. 84 FOR -Y6- PROFILE.  
SEE SHEET NO. 86 FOR -Y6RPA- PROFILE.  
SEE SHEET NO. 87 FOR -Y6RPC- PROFILE.  
SEE SHEET NO. 88 FOR -Y6RPD- PROFILE.  
SEE SHEET NO. 89 FOR -Y6LPA- PROFILE.  
SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.  
ALL CSP TO BE ROD AND LUG CONNECTED.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

04/26/2005  
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 28c.dwg

**HDR** HDR Engineering, Inc.  
of the Carolinas  
3733 National Drive, Suite 207 Raleigh, N.C. 27612

MATCH LINE SEE SHEET NO. 28a



PIPE OUTLET  
 DA..... 4.93 AC  
 Q2..... 7.68 CFS  
 V2..... 1.09 FTS  
 Q10..... 10.84 CFS  
 V10..... 1.53 FTS

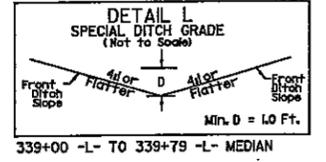
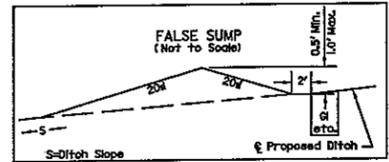
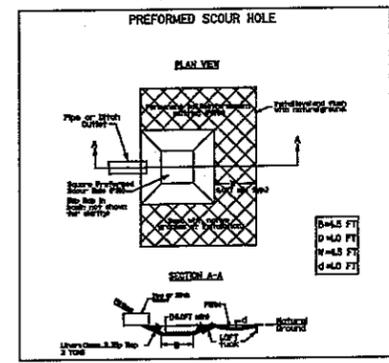
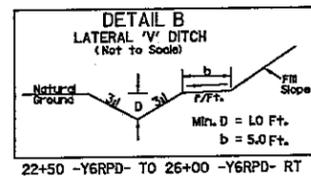
PIPE OUTLET  
 DA..... 21.06 AC  
 Q2..... 2.40 CFS  
 V2..... 0.34 FTS  
 Q10..... 4.24 CFS  
 V10..... 0.60 FTS

PIPE OUTLET  
 DA..... 6.57 AC  
 Q2..... 1.91 CFS  
 V2..... 0.27 FTS  
 Q10..... 2.40 CFS  
 V10..... 2.14 FTS

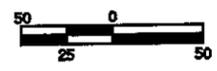
**SITE 14**

17

SUSTAINABLE FORESTS, LLC  
 DB 583 PG 251  
 DB 494 PG 163  
 MB 02 PG 01



NOTES: SEE SHEETS NO. 66-67 FOR -L- PROFILE.  
 SEE SHEET NO. 84 FOR -Y6- PROFILE.  
 SEE SHEET NO. 86 FOR -Y6RPA- PROFILE.  
 SEE SHEET NO. 87 FOR -Y6RPC- PROFILE.  
 SEE SHEET NO. 88 FOR -Y6RPD- PROFILE.  
 SEE SHEET NO. 89 FOR -Y6LPA- PROFILE.  
 SEE SHEET NO. 2-J FOR STRUCTURE DETAIL.  
 ALL CSP TO BE ROD AND LUG CONNECTED.  
 FIRST 5' OF MECHANIZED CLEARING FROM SLOPE  
 STAKE LINE MAY BE USED FOR INSTALLATION  
 OF SEDIMENT & EROSION CONTROL MEASURES.



- FILL IN SURFACE WATER
- FILL IN WETLAND
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING
- TEMPORARY FILL IN WETLAND

**BARNHILL CONTRACTING COMPANY**

PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>28d</b>
R/W SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
<b>HDR</b> HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	

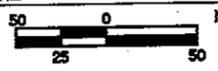
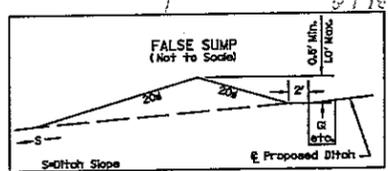
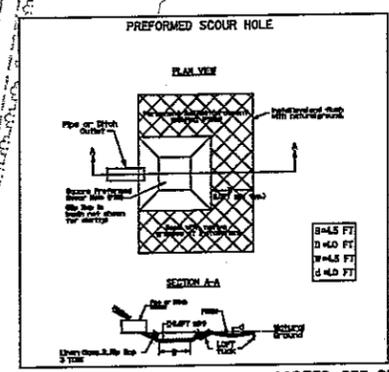
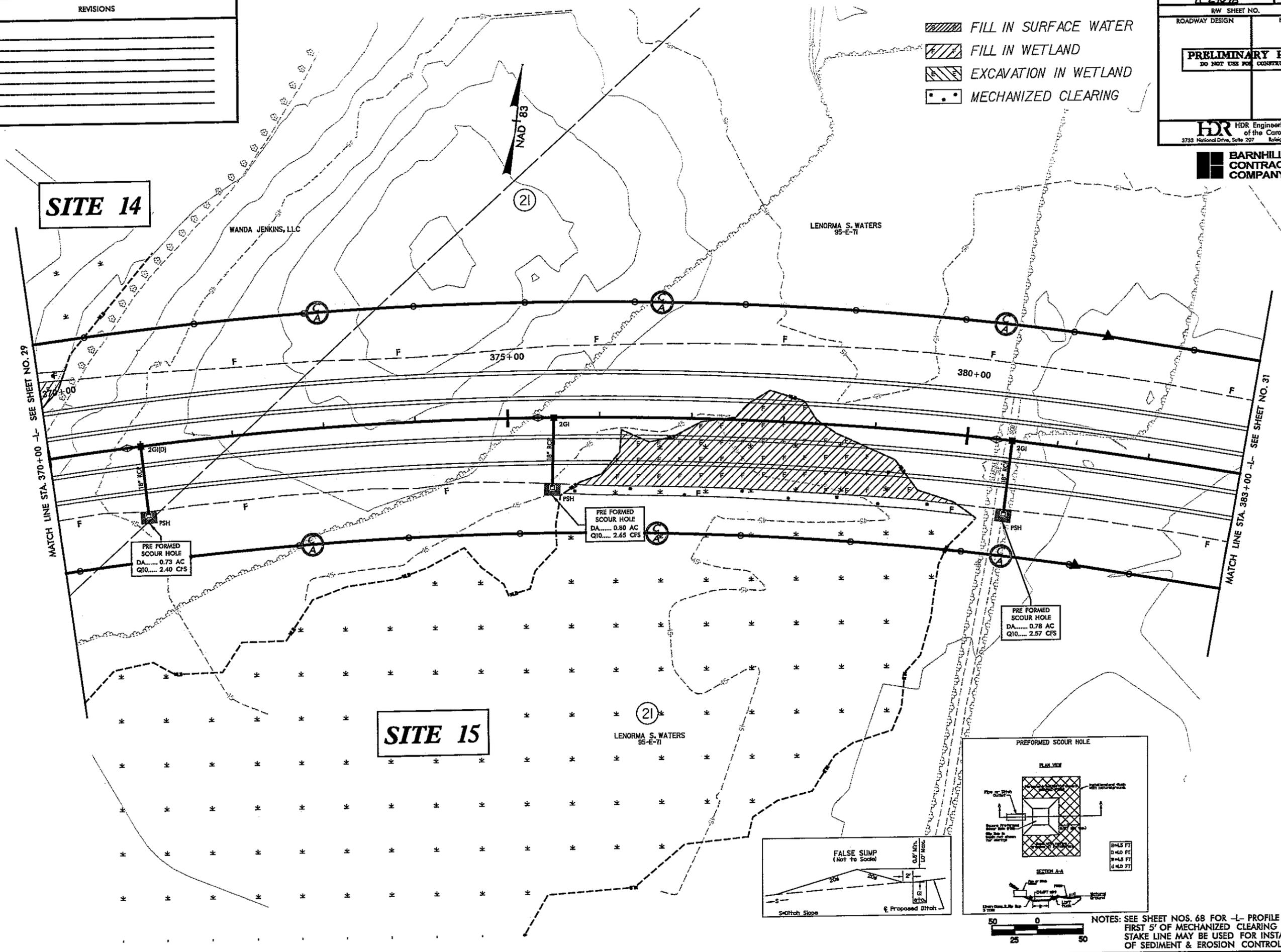
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PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>30</b>
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	
 <b>BARNHILL CONTRACTING COMPANY</b>	

REVISIONS	

-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING



NOTES: SEE SHEET NOS. 68 FOR -I- PROFILE FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

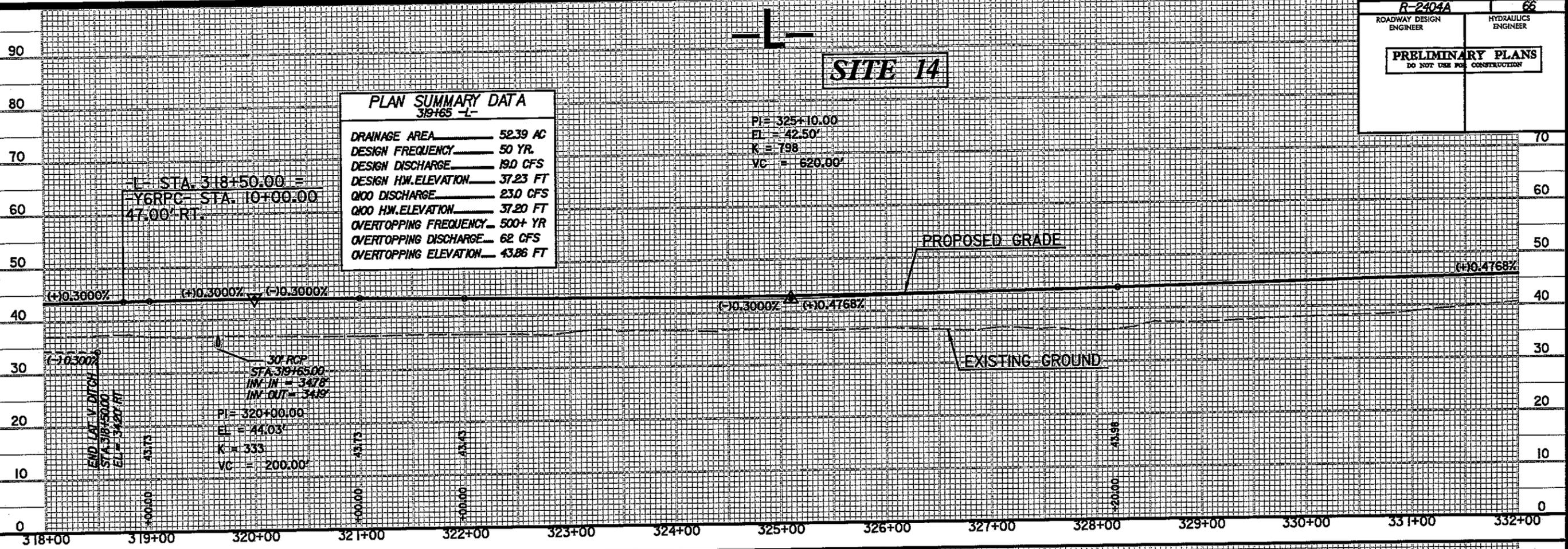
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### SITE 14

PLAN SUMMARY DATA 319+65 -L-	
DRAINAGE AREA	52.39 AC
DESIGN FREQUENCY	50 YR.
DESIGN DISCHARGE	19.0 CFS
DESIGN HW.ELEVATION	37.23 FT
Q100 DISCHARGE	23.0 CFS
Q100 HW.ELEVATION	37.20 FT
OVERTOPPING FREQUENCY	500+ YR
OVERTOPPING DISCHARGE	62 CFS
OVERTOPPING ELEVATION	43.86 FT

PI = 325+10.00  
 EL = 42.50'  
 K = 798  
 VC = 620.00'

L- STA. 318+50.00 =  
 -Y6RPC- STA. 10+00.00  
 47.00' RT.

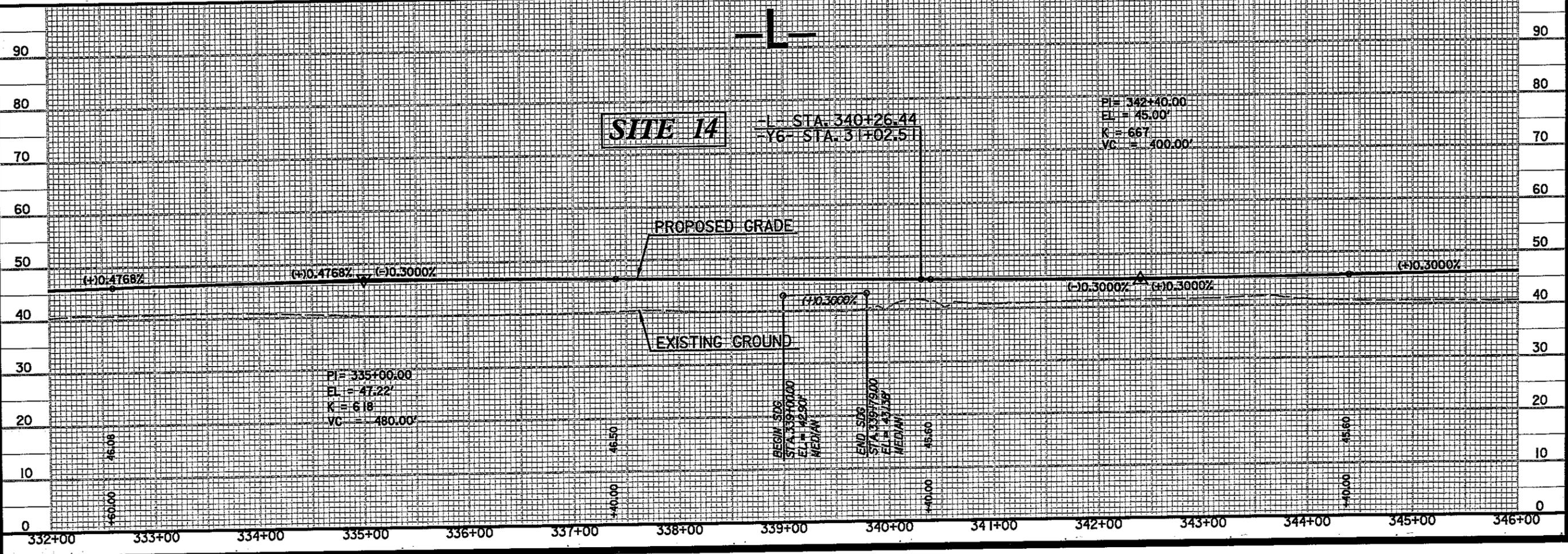


### SITE 14

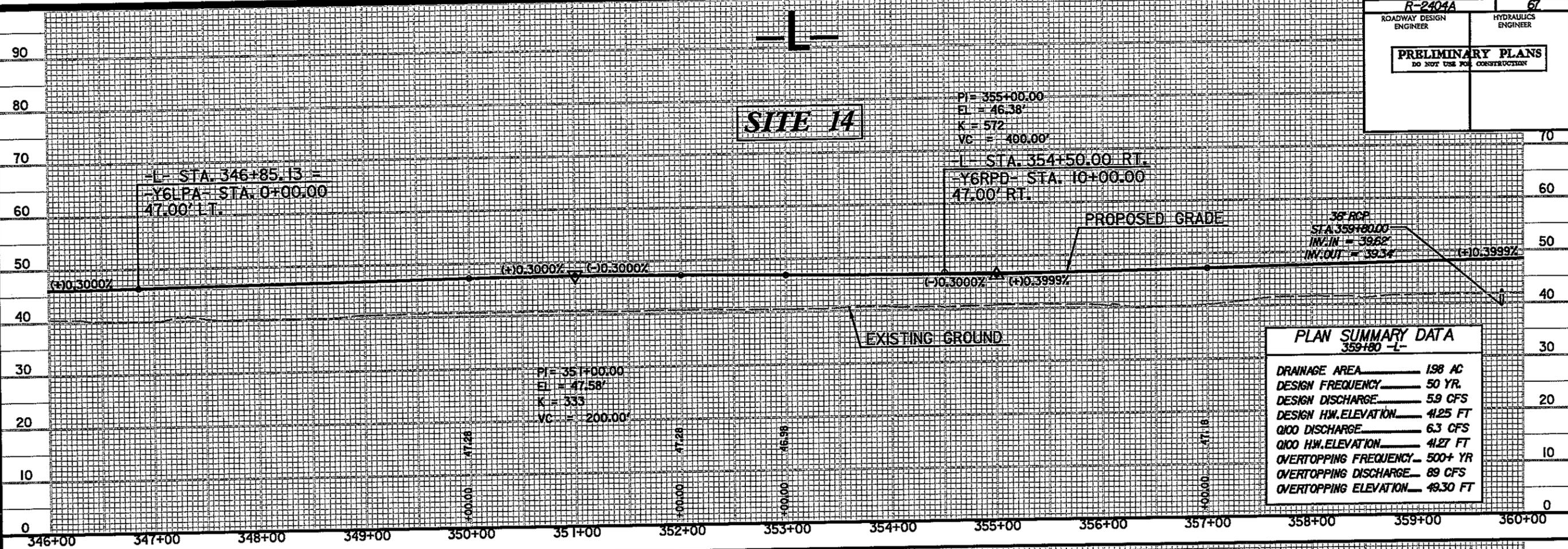
PI = 342+40.00  
 EL = 45.00'  
 K = 667  
 VC = 400.00'

-L- STA. 340+26.44  
 -Y6- STA. 31+02.51

PI = 335+00.00  
 EL = 47.22'  
 K = 618  
 VC = 480.00'

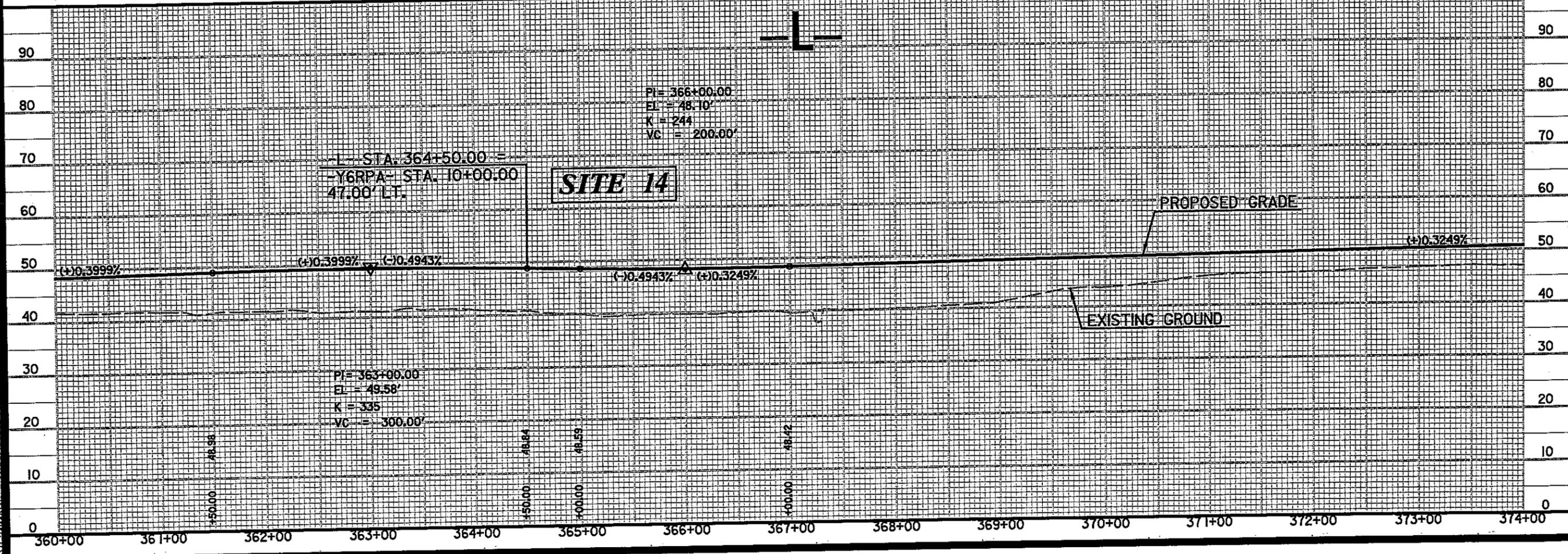


5/28/99

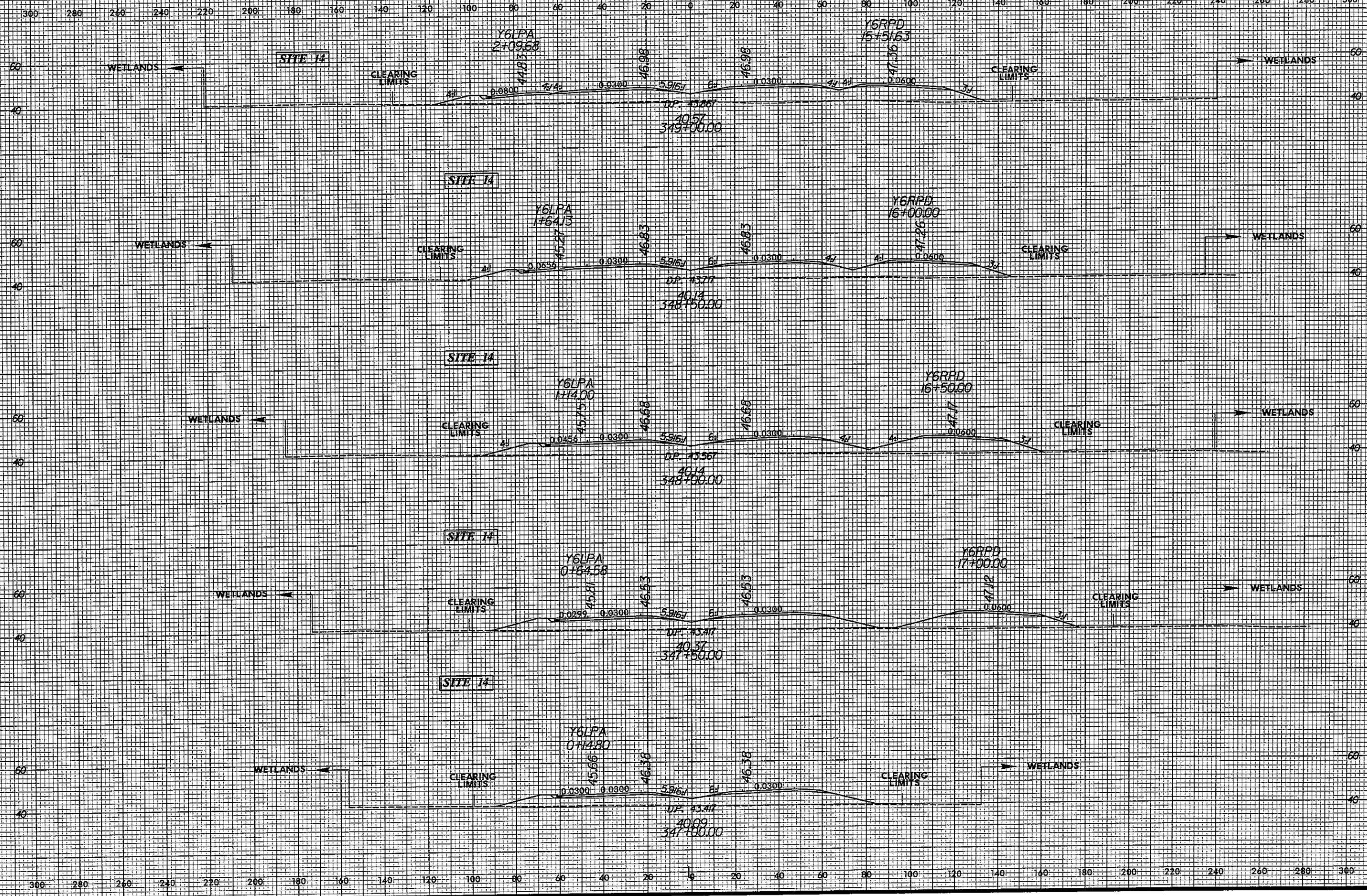


PLAN SUMMARY DATA	
359+80 -L-	
DRAINAGE AREA	198 AC
DESIGN FREQUENCY	50 YR.
DESIGN DISCHARGE	5.9 CFS
DESIGN H.W. ELEVATION	41.25 FT
Q100 DISCHARGE	6.3 CFS
Q100 H.W. ELEVATION	41.27 FT
OVERTOPPING FREQUENCY	500+ YR
OVERTOPPING DISCHARGE	89 CFS
OVERTOPPING ELEVATION	49.30 FT

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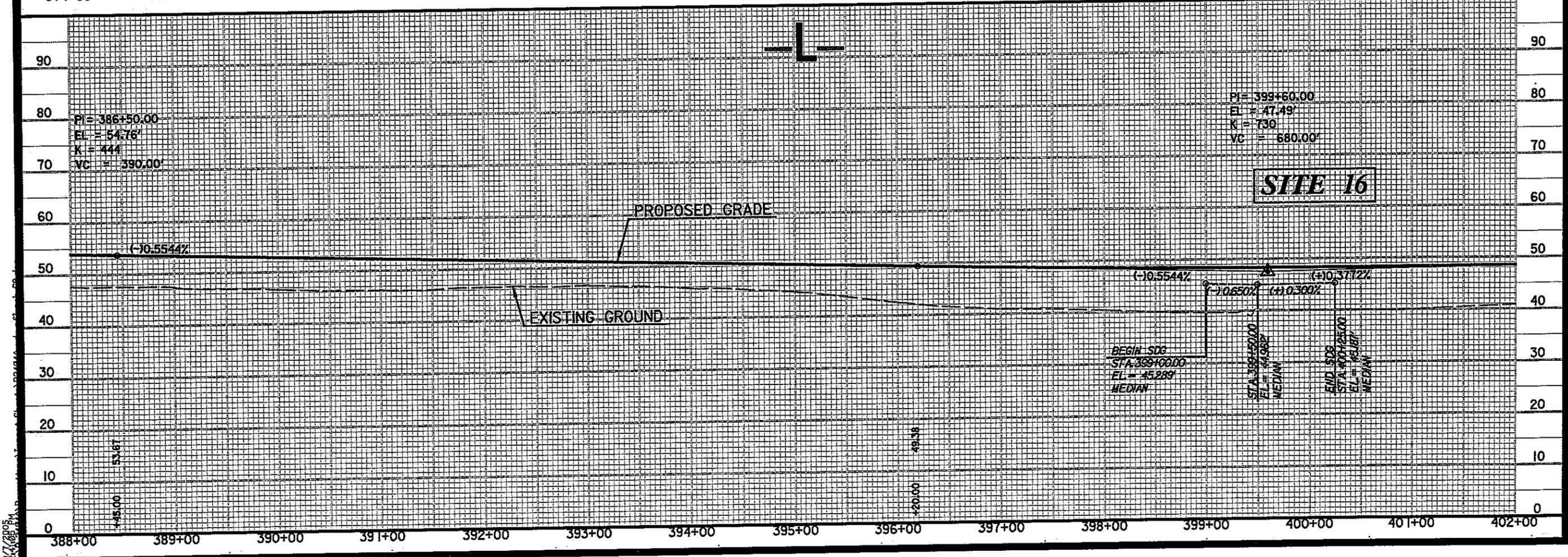
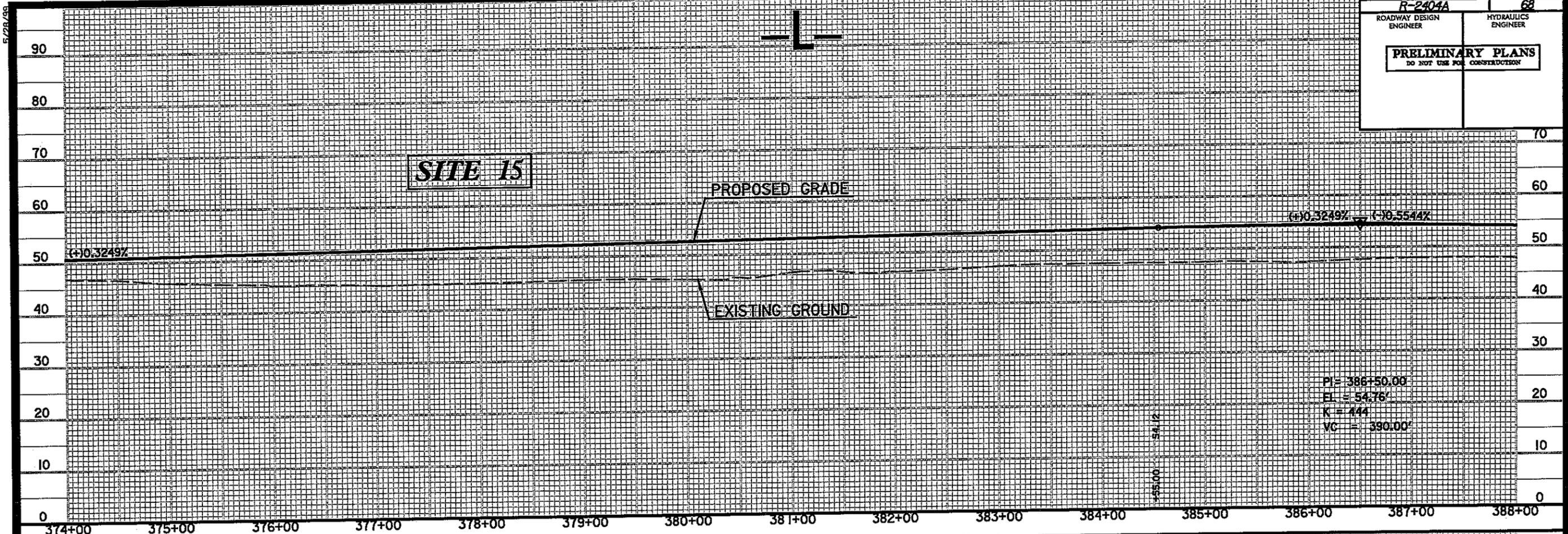


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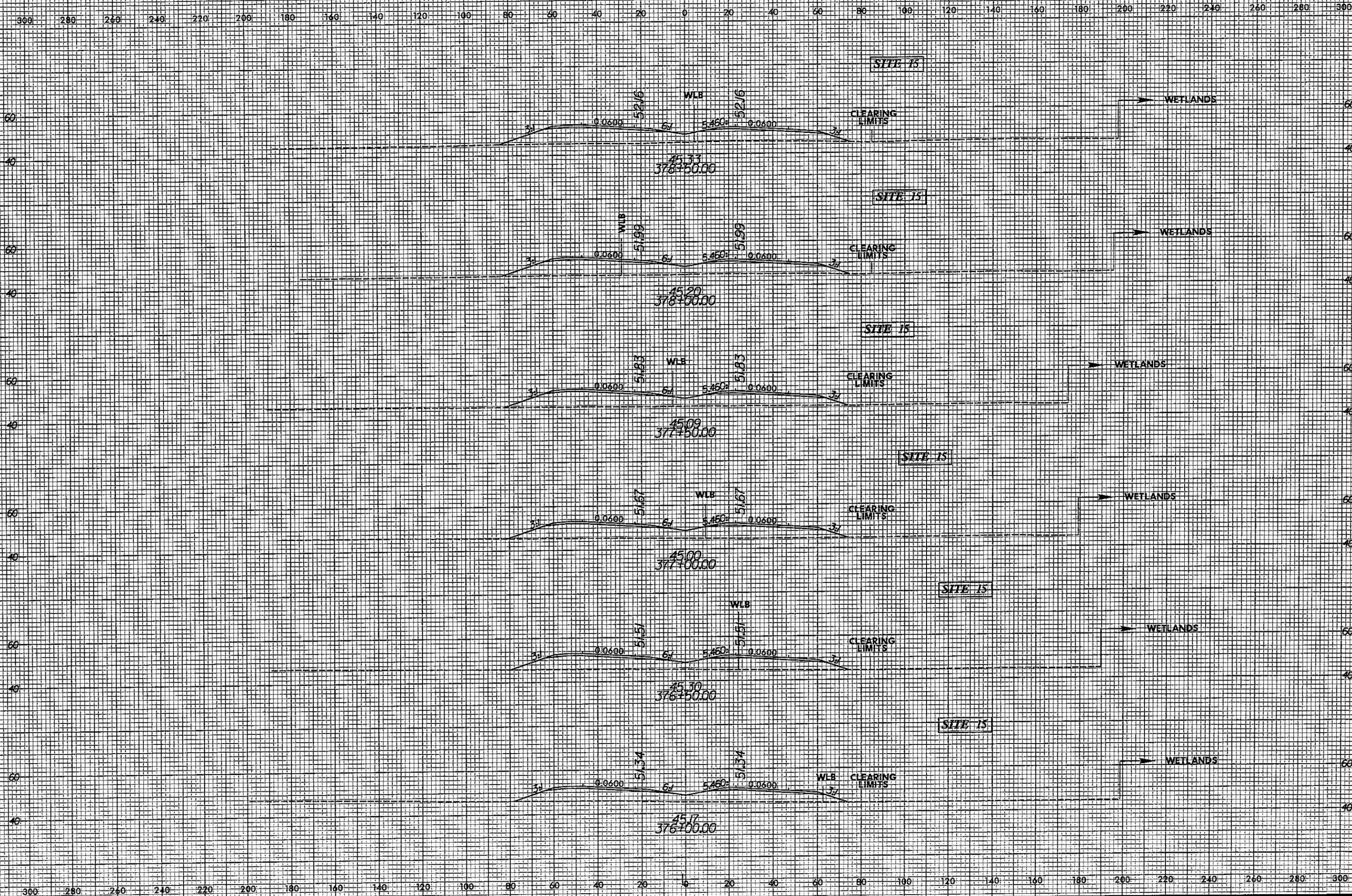


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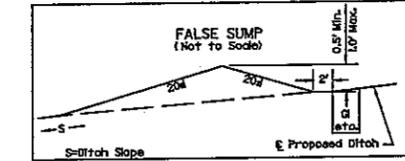
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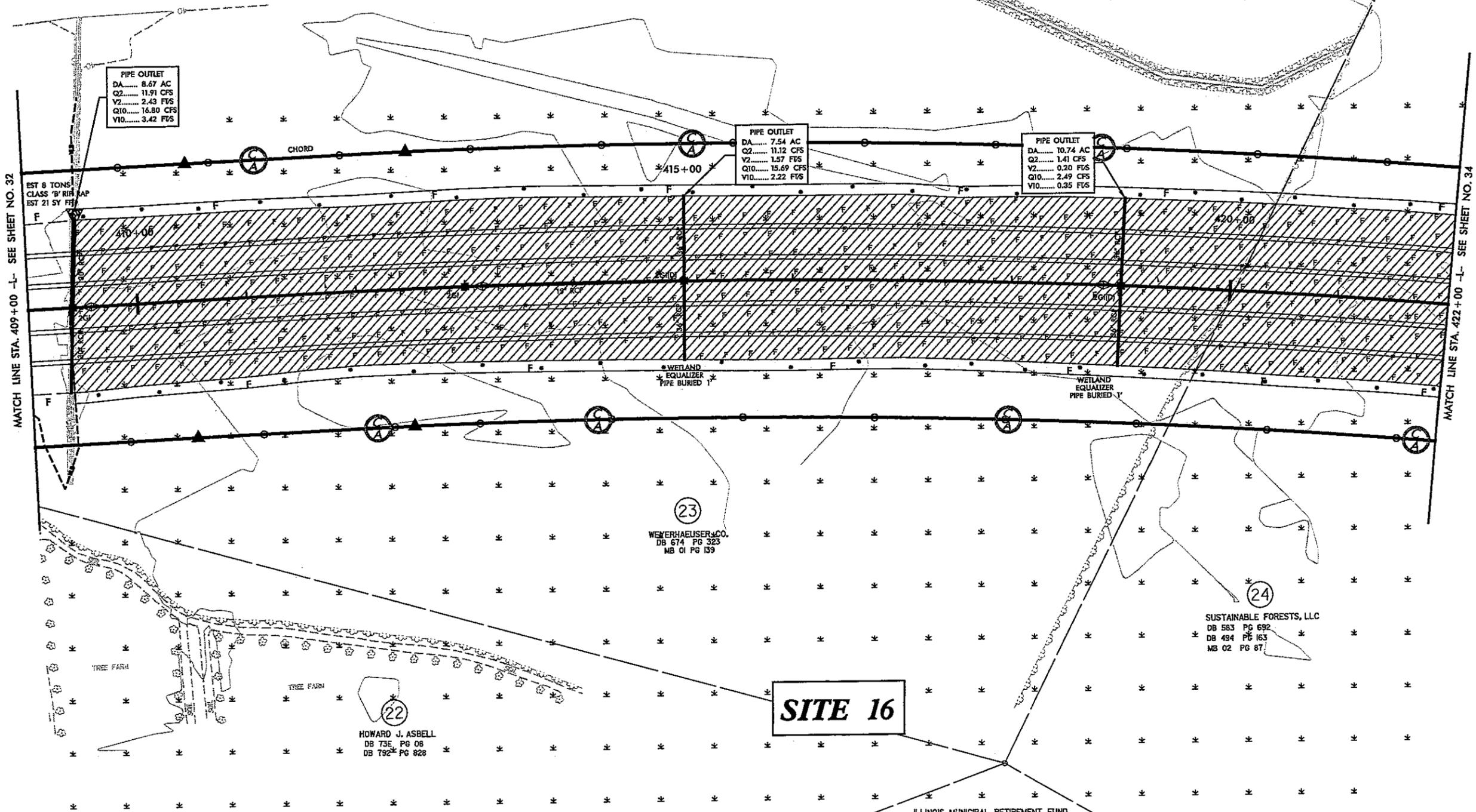
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-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING

NAD 83



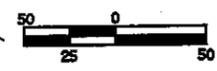
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WEYERHAEUSER CO.  
DB 674 PG 323  
MB 01 PG 139



MATCH LINE STA. 409+00 -L- SEE SHEET NO. 32

MATCH LINE STA. 422+00 -L- SEE SHEET NO. 34

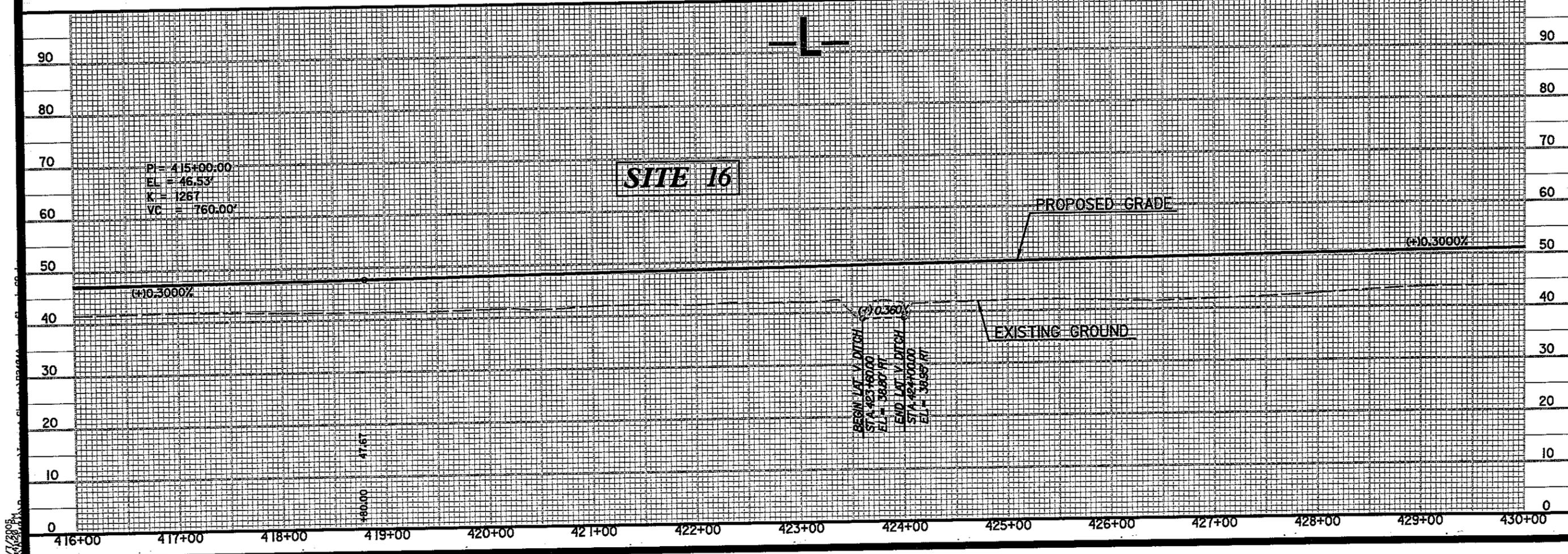
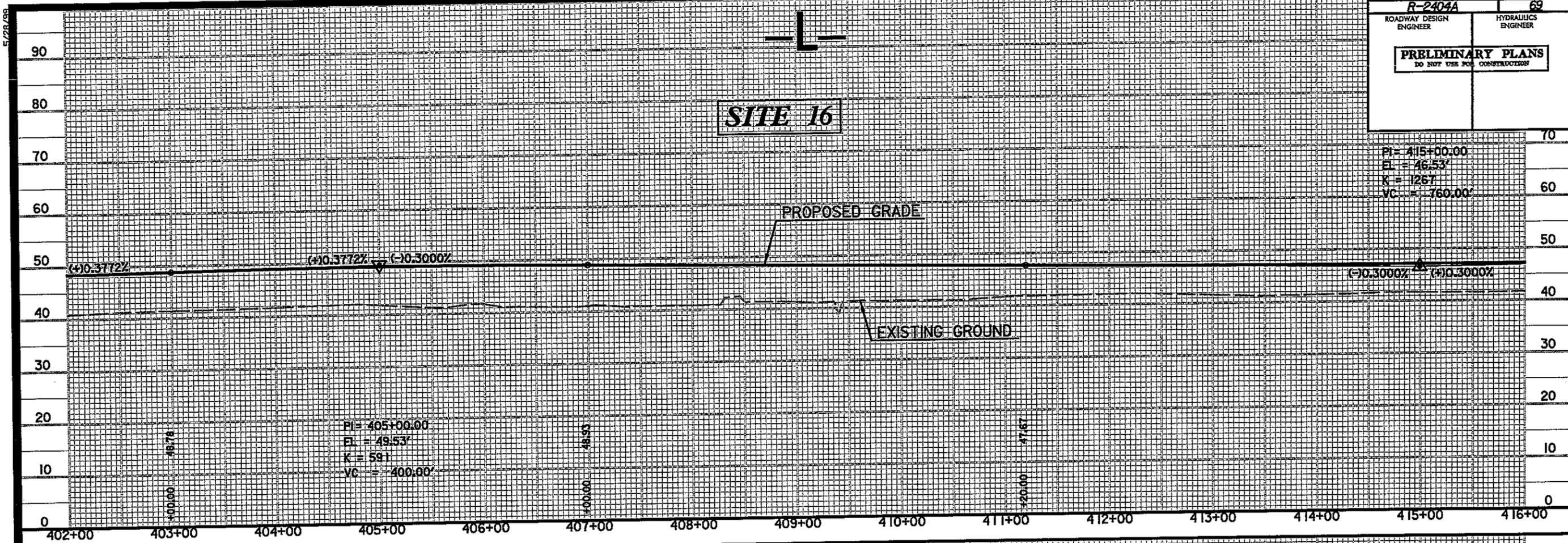
**SITE 16**



NOTES: SEE SHEET NO. 69 FOR -L- PROFILE  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE  
STAKE LINE MAY BE USED FOR INSTALLATION  
OF SEDIMENT & EROSION CONTROL MEASURES.

8/24/2005 14:05 PM \\s01\proj\1\m\mccor\Sheet\2404A.rvt\mccor\33.dgn

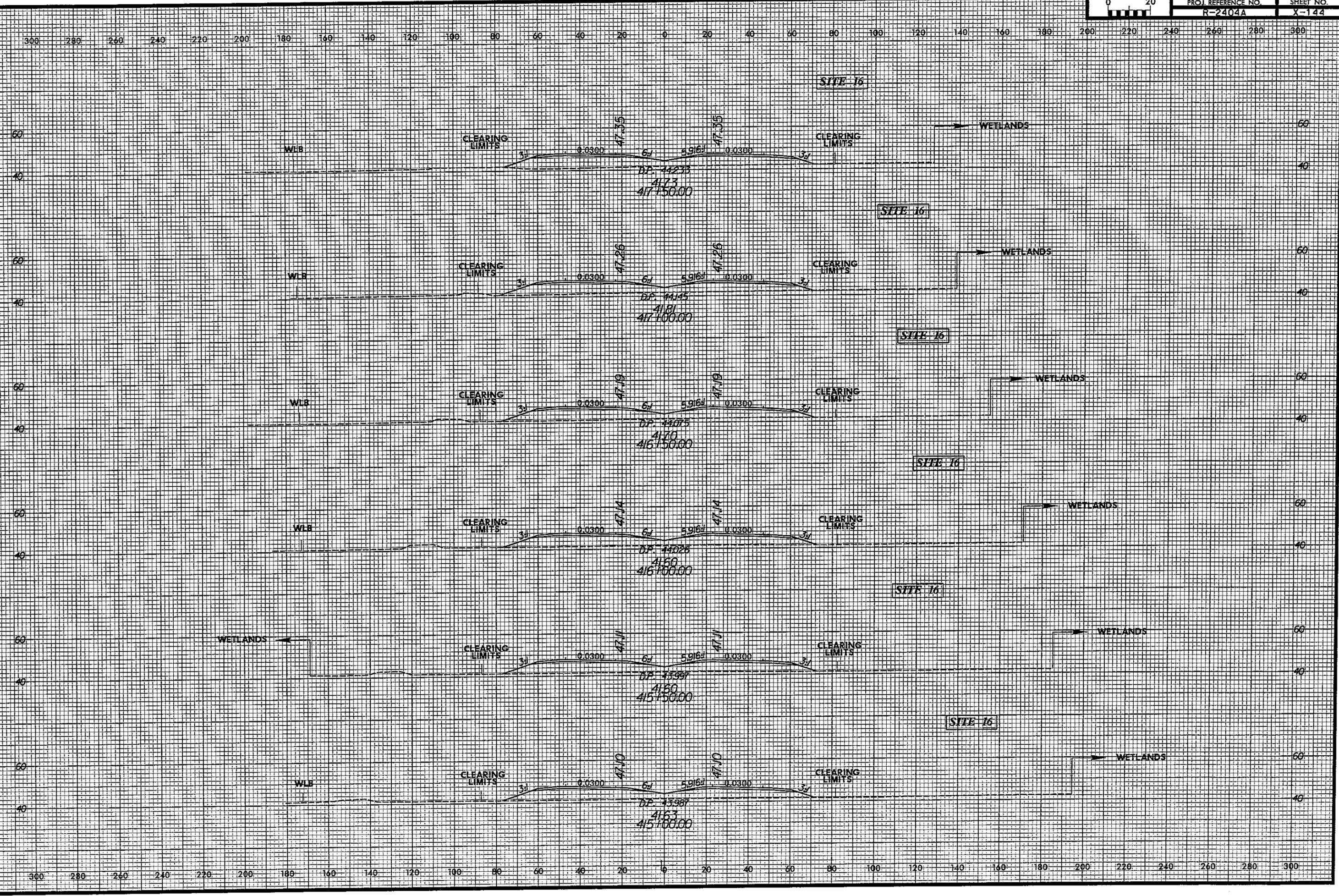




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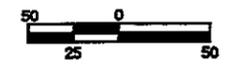
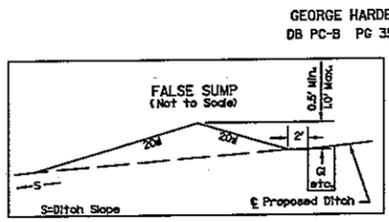
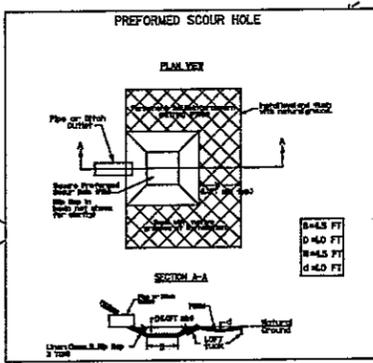
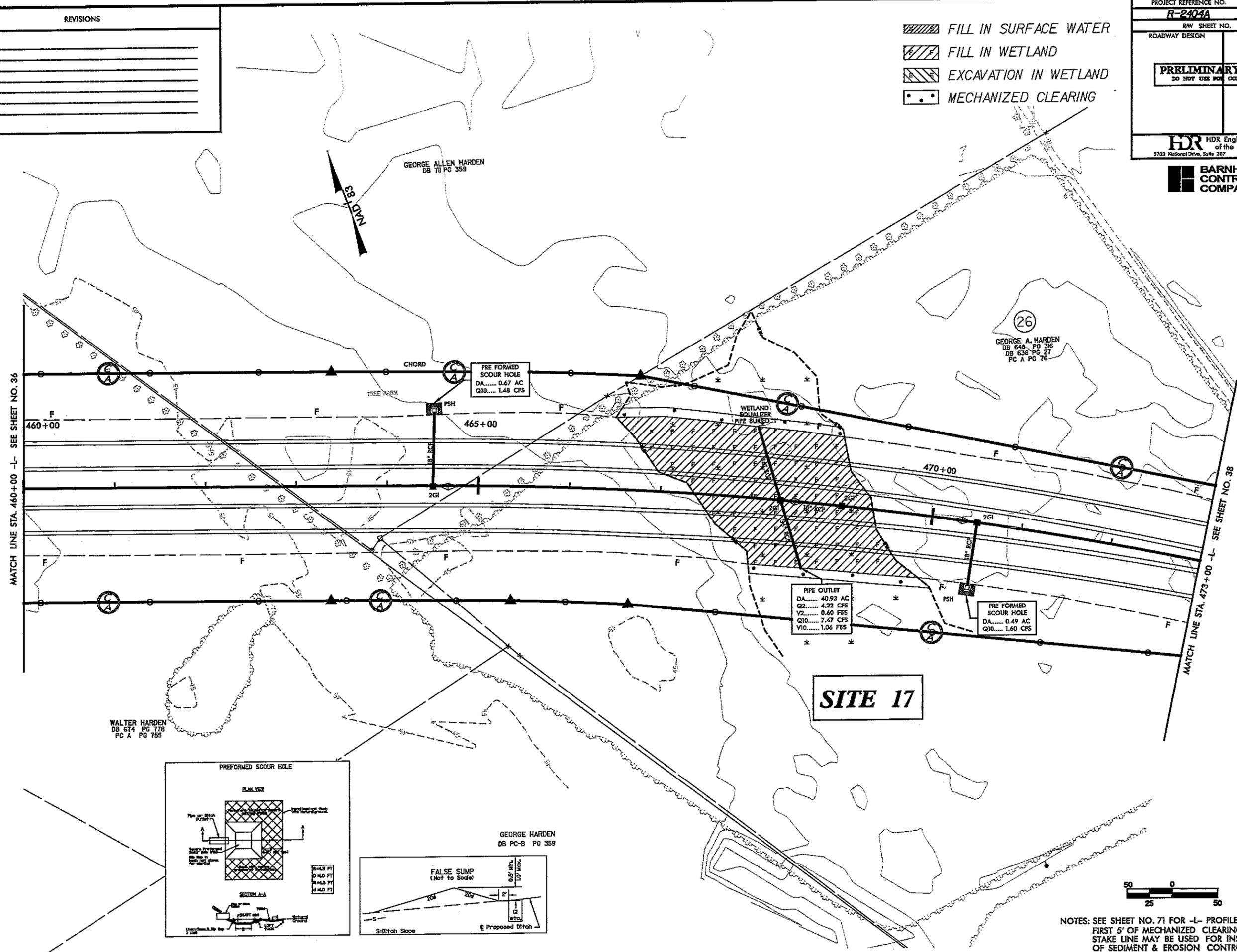
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-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING

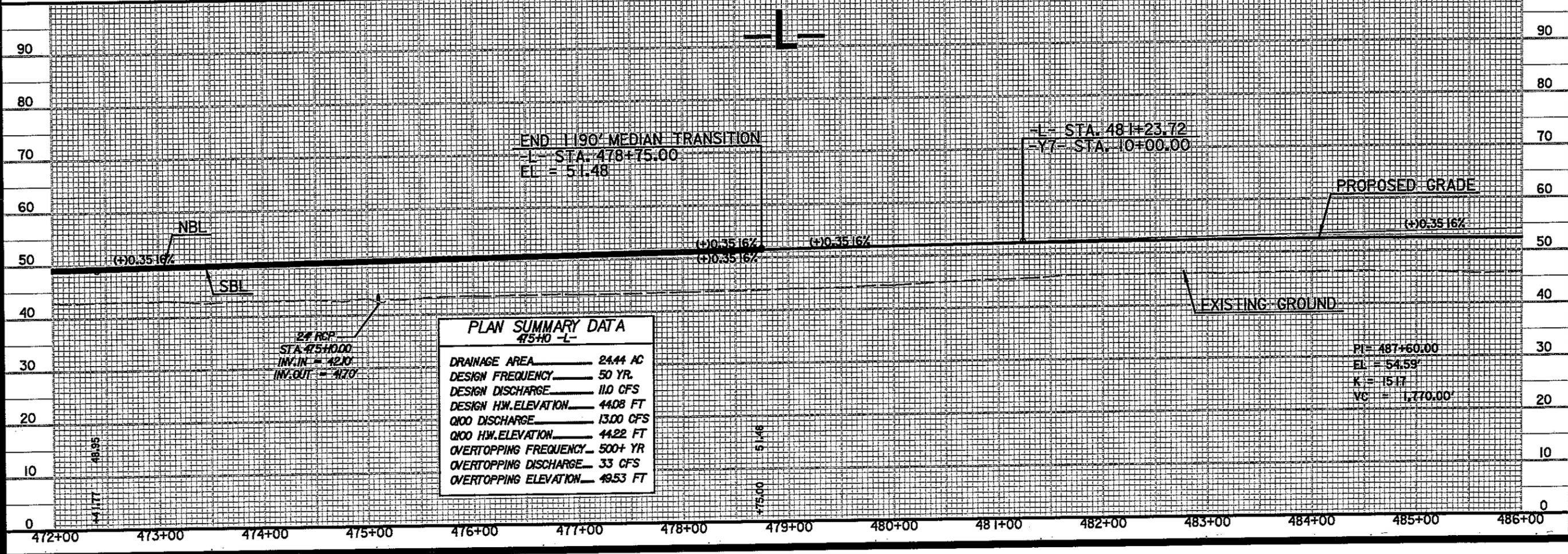
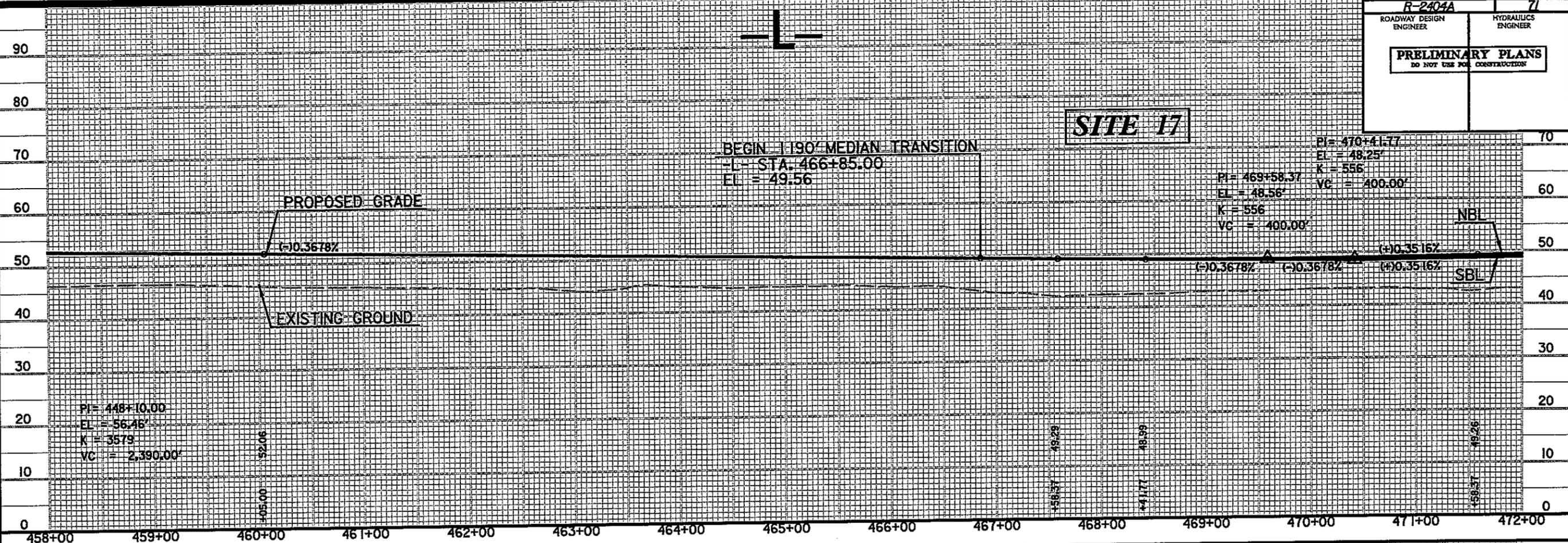
REVISIONS



NOTES: SEE SHEET NO. 71 FOR -L- PROFILE.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

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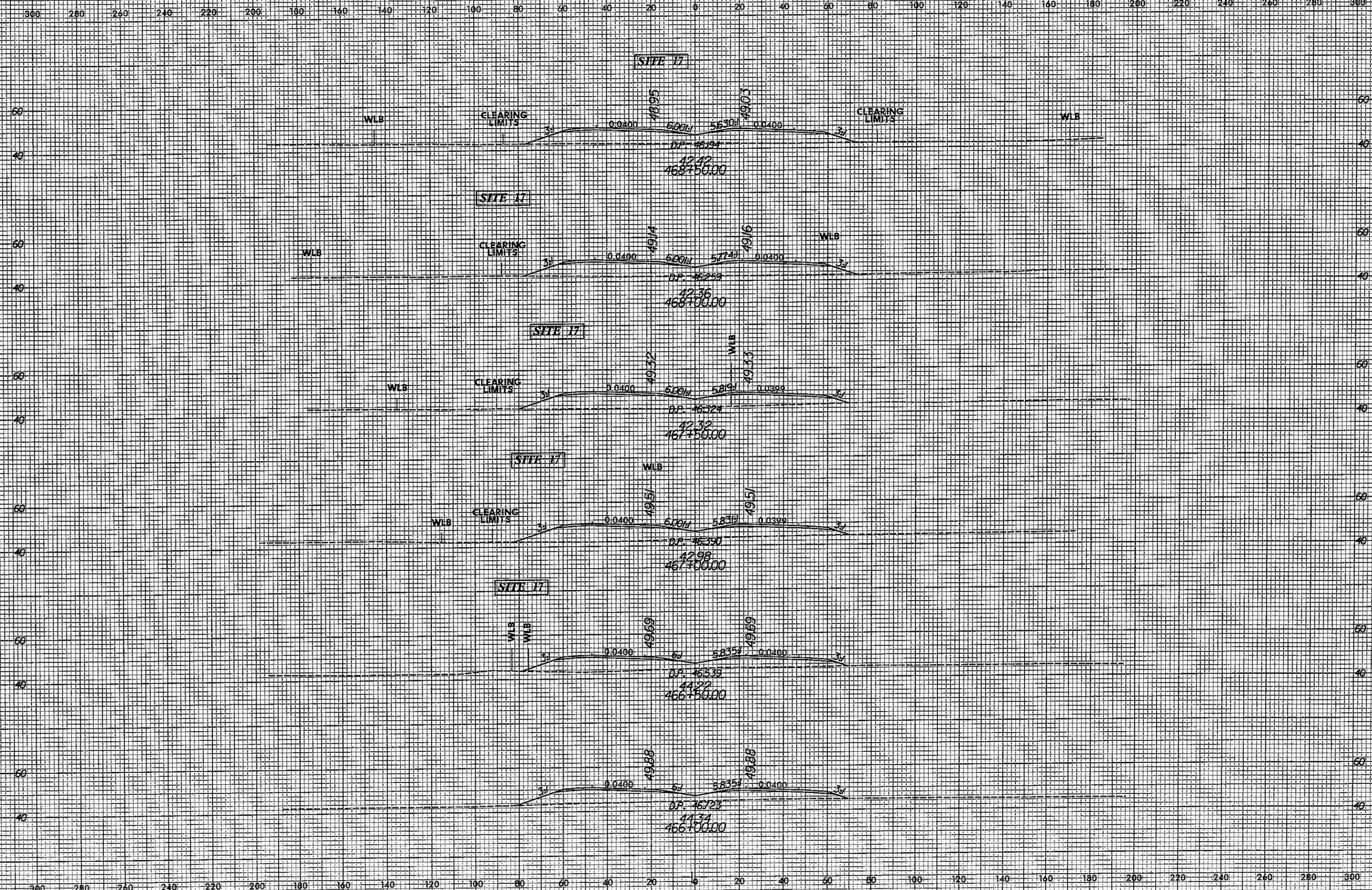
**SITE 17**



PLAN SUMMARY DATA	
475+10 -L-	
DRAINAGE AREA	2444 AC
DESIGN FREQUENCY	50 YR.
DESIGN DISCHARGE	110 CFS
DESIGN HW.ELEVATION	4408 FT
Q100 DISCHARGE	1300 CFS
Q100 HW.ELEVATION	4422 FT
OVERTOPPING FREQUENCY	500+ YR
OVERTOPPING DISCHARGE	33 CFS
OVERTOPPING ELEVATION	4953 FT

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8/23/99



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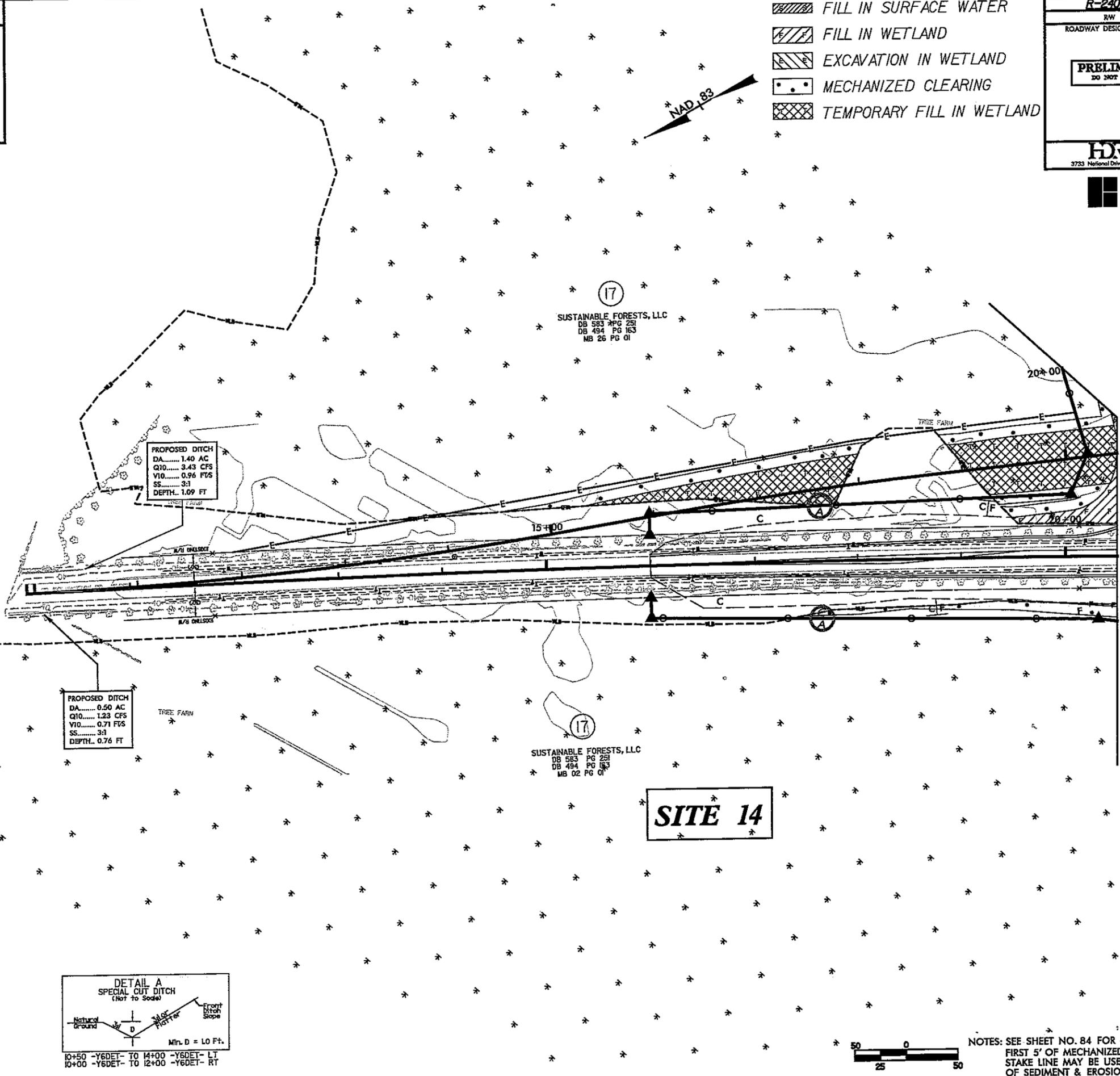
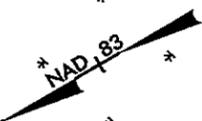


REVISIONS


-  FILL IN SURFACE WATER
-  FILL IN WETLAND
-  EXCAVATION IN WETLAND
-  MECHANIZED CLEARING
-  TEMPORARY FILL IN WETLAND

PROJECT REFERENCE NO. <b>R-2404A</b>	SHEET NO. <b>50</b>
R/W SHEET NO. ROADWAY DESIGN	REVISIONS HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612	

**BARNHILL CONTRACTING COMPANY**



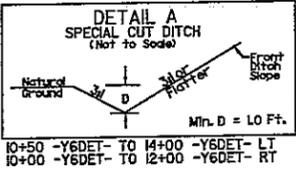
PROPOSED DITCH  
DA..... 1.40 AC  
Q10..... 3.43 CFS  
V10..... 0.96 FTS  
SS..... 3:1  
DEPTH.. 1.09 FT

PROPOSED DITCH  
DA..... 0.50 AC  
Q10..... 1.23 CFS  
V10..... 0.71 FTS  
SS..... 3:1  
DEPTH.. 0.76 FT

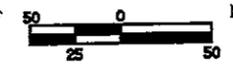
(17)

(17)

**SITE 14**



MATCH LINE STA. 20+50 -Y6- SEE SHEET NO. 28

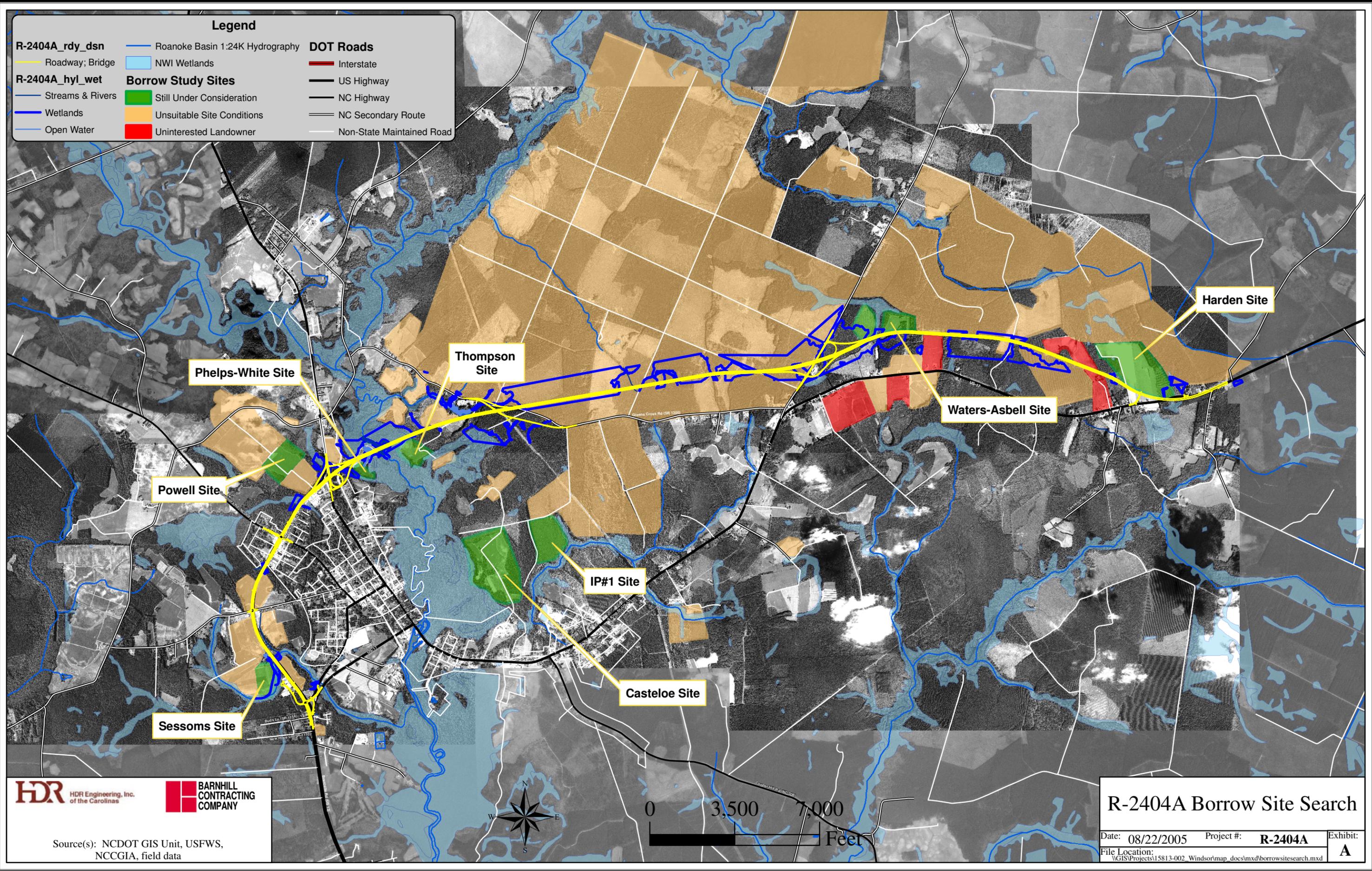


NOTES: SEE SHEET NO. 84 FOR -Y6- PROFILE.  
FIRST 5' OF MECHANIZED CLEARING FROM SLOPE STAKE LINE MAY BE USED FOR INSTALLATION OF SEDIMENT & EROSION CONTROL MEASURES.

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**Legend**

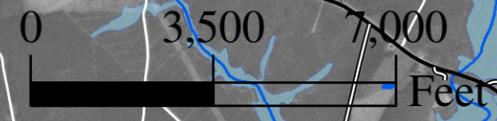
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— Roadway; Bridge	— NWI Wetlands	— Interstate
<b>R-2404A_hyl_wet</b>	<b>Borrow Study Sites</b>	— US Highway
— Streams & Rivers	— Still Under Consideration	— NC Highway
— Wetlands	— Unsuitable Site Conditions	— NC Secondary Route
— Open Water	— Uninterested Landowner	— Non-State Maintained Road



**HDR** HDR Engineering, Inc. of the Carolinas

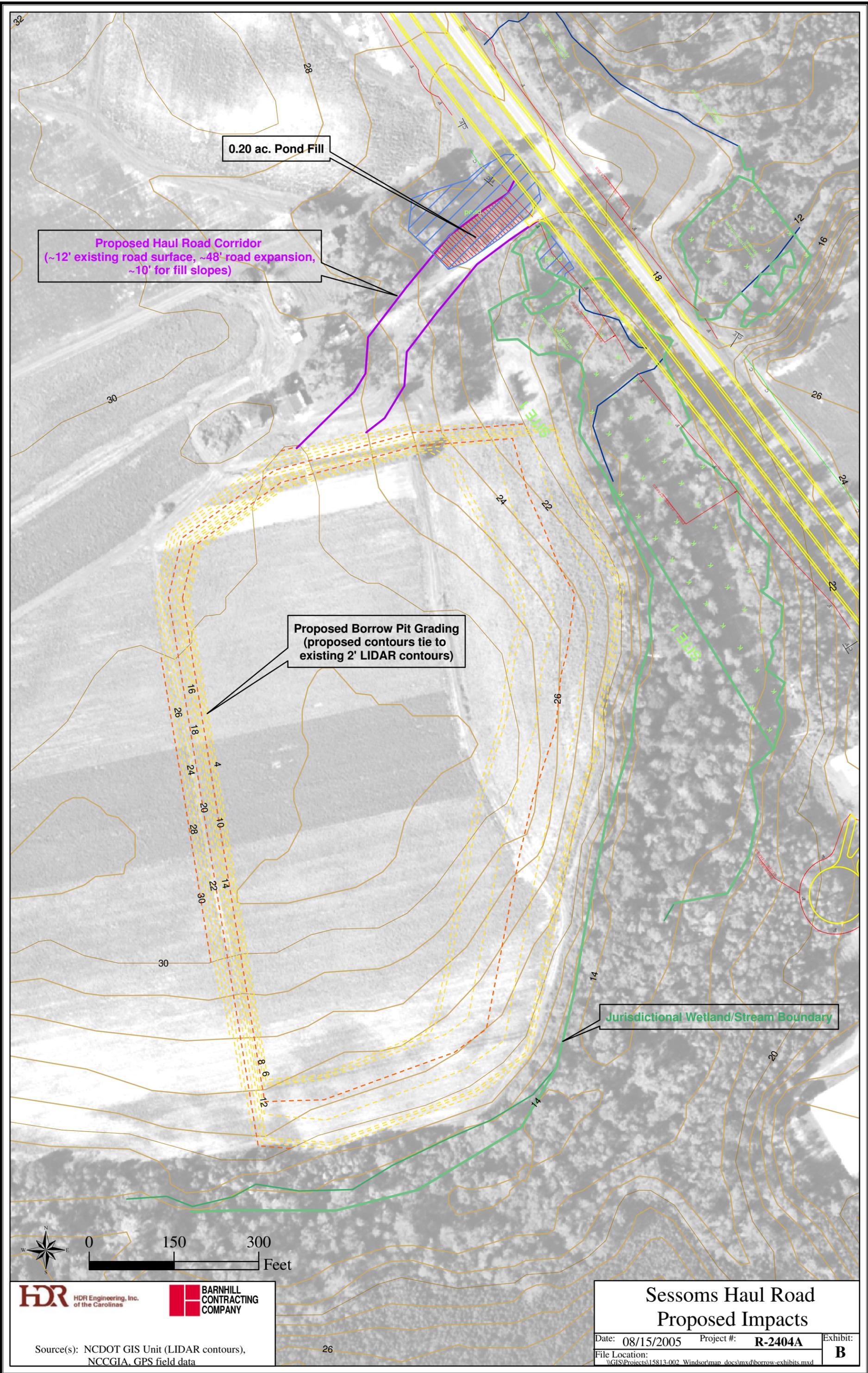
**BARNHILL CONTRACTING COMPANY**

Source(s): NCDOT GIS Unit, USFWS, NCCGIA, field data



### R-2404A Borrow Site Search

Date: 08/22/2005	Project #: <b>R-2404A</b>	Exhibit: <b>A</b>
File Location: \\GIS\Projects\15813-002_Windsor\map_docs\mxd\borrowsitesearch.mxd		



0.20 ac. Pond Fill

Proposed Haul Road Corridor  
 (~12' existing road surface, ~48' road expansion,  
 ~10' for fill slopes)

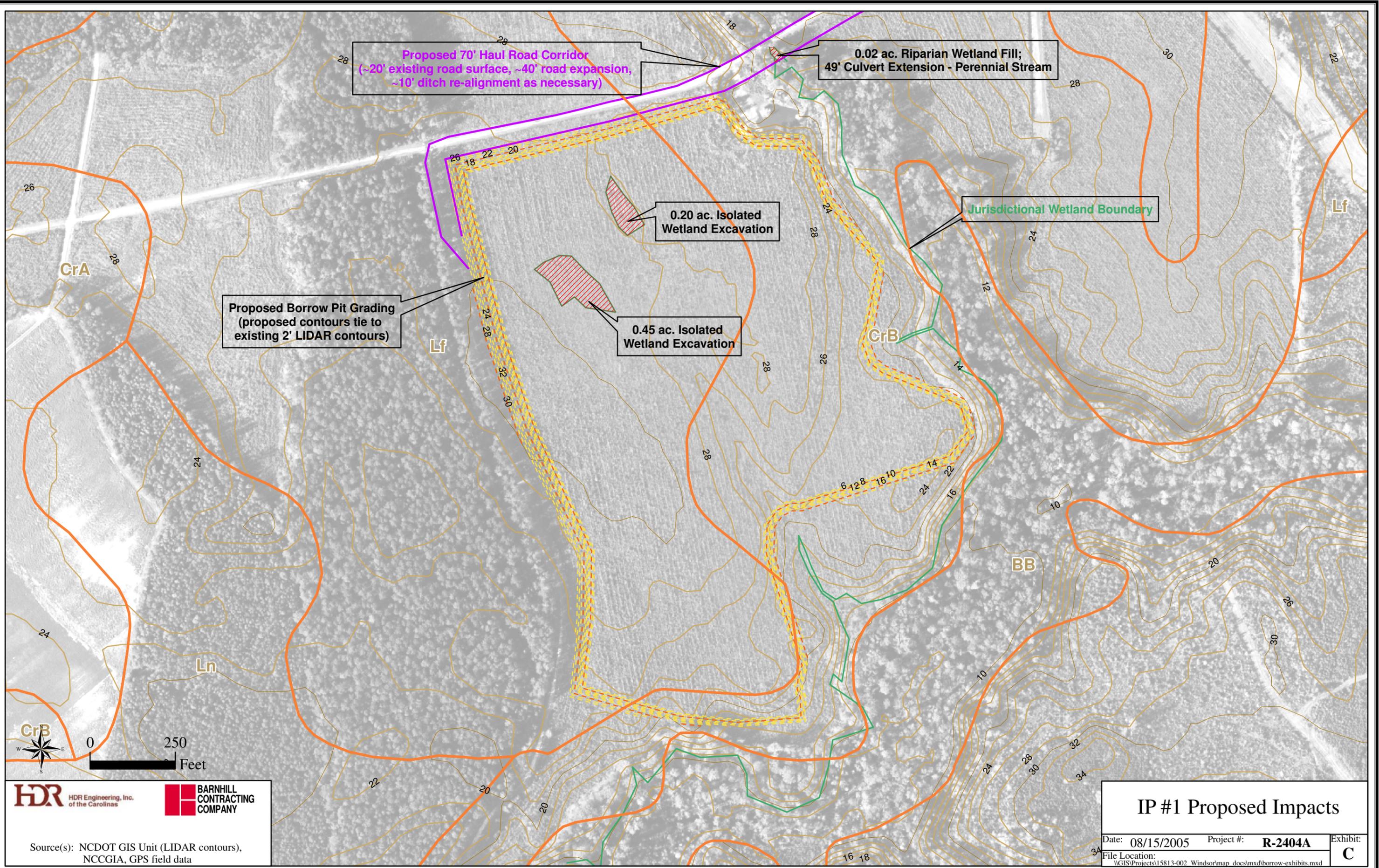
Proposed Borrow Pit Grading  
 (proposed contours tie to  
 existing 2' LIDAR contours)

Jurisdictional Wetland/Stream Boundary



Source(s): NCDOT GIS Unit (LIDAR contours),  
 NCCGIA, GPS field data

<b>Sessoms Haul Road Proposed Impacts</b>		
Date: 08/15/2005	Project #: R-2404A	Exhibit: B
File Location: \\GIS\Projects\15813-002 Windsor\map_docs\mxd\borrow-exhibits.mxd		



Source(s): NCDOT GIS Unit (LIDAR contours),  
 NCCGIA, GPS field data

### IP #1 Proposed Impacts

Date: 08/15/2005	Project #: R-2404A	Exhibit: C
File Location: \GIS\Projects\15813-002 Windsor\map_docs\msd\borrow-exhibits.mxd		